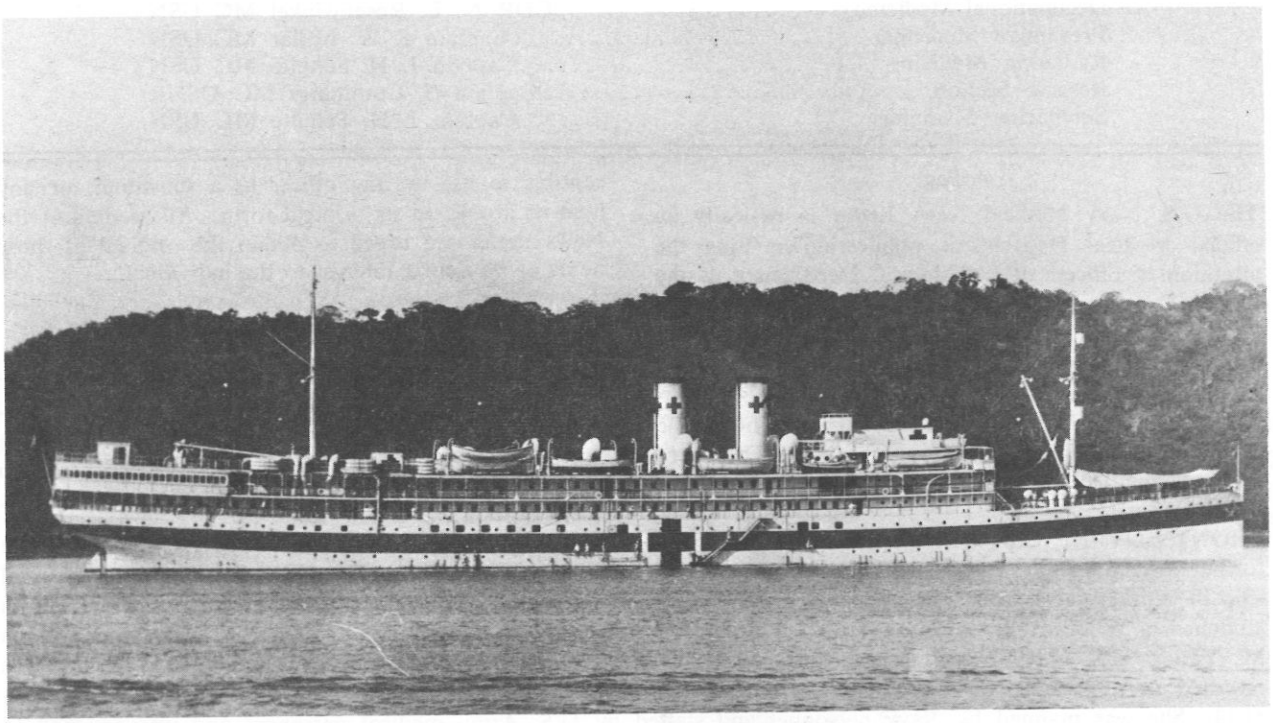
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UNITED STATES NAVY Medical News Letter

Vol. 48 Friday, 9 September 1966 No. 5



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United States Navy
MEDICAL NEWS LETTER

Vol. 48 Friday, 9 September 1966 No. 5

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Change of Address

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FRONT COVER: USS MERCY (AH-8). The USS MERCY is the second ship of the name. The first was the former liner SS SARATOGA, built in 1907, purchased by the Navy in September 1917 for duty as a hospital ship in World War I. She was stricken from the Navy list and sold during March 1939. The USS MERCY was launched at Wilmington, California, on 25 March 1943, under the sponsorship of Lieutenant (junior grade) Doris M. Yetter, U.S. Navy Nurse Corps, who had been captured by Japanese forces on Guam, in 1941, but was returned as a prisoner of war. MERCY was placed in commission at San Pedro, California, on 7 August 1944. She was manned by Navy personnel and staffed by U.S. Army medical personnel and was assigned to the Naval Transportation Service and was under operational control of the Fifth and Seventh Fleets. On 31 August 1944, MERCY sailed for Pearl Harbor where certain changes, including conversion of one ward to provide enlarged operating room facilities were made. During the fall of this year, she supported the initial landing operation at Leyte taking in wounded during heavy air raids (October 25 and 26) and transferring them to Manus, Admiralty Islands. During the next five months, MERCY completed seven more missions into Leyte, taking patients to Hollandia, New Guinea or Manus, Admiralty Islands. Early in January 1945, this duty was temporarily relieved by a mission to Lae and Aitape, New Guinea to transport the Third Field Hospital to Tacolban, Philippine Islands. In March 1945, she reported to the Fifth Fleet at Ulithi, preparatory to the Okinawa Campaign and departed Okinawa on 23 April with patients who were taken to Saipan. Two more missions into Okinawa were completed by 24 May. On 24 May, she was ordered to duty with the Seventh Fleet and after several voyages with patients and a period as a station hospital ship in Manila, she was sent to Jinsen, Korea where she assumed duties as a station hospital ship. In October, MERCY steamed via Manila to San Pedro, California where she underwent drydock and repairs. She sailed for the Hawaiian Islands 4 February 1946 where she remained until 2 April and then sailed for San Francisco where she was decommissioned and turned over to the Army for further service as a hospital ship. She had landed two battle stars for engagements in the Pacific: 1 Star/Leyte Landings, 22 October to 16 December 1944 and 1 Star/Assault and Occupation of Okinawa Gunto, 19 April to 17 May 1945. The MERCY had an overall length of 416 feet, a beam of 60 feet and a designed speed of 15.3 knots.

The issuance of this publication approved by the Secretary of the Navy on 4 May 1964.

SYMPTOMATIC HIATUS HERNIA AND ASSOCIATED ESOPHAGITIS

Herbert D. Adams MD, Lahey Clinic Foundation, Boston.* *Postgrad Med 40(1): 1-5, July 1966.*

Symptomatic sliding hiatus hernia is caused by a combination of two factors: (1) a disruption of the cardia's valvelike mechanism resulting in reflux esophagitis, and (2) a coexisting ulcer diathesis. Diagnosis is by radiography and esophagoscopy, and the medical management of the patient includes a permanent ulcer regimen. If such disorders are neglected, progression may eventually necessitate extensive surgery.

Disorders of the esophagus, cardia and proximal stomach are confusing and complex and tend to merge with each other; their cause is not clear, and their long-term effects are not understood. Furthermore, the early indications for treatment have not been clearly outlined so that the more serious results may be prevented.

Among these conditions are cardiospasm, achalasia, esophagitis and peptic ulceration as well as organic stricture, which results if these disorders are neglected and not treated vigorously and actively from their onset. One of the most common problems is the effect on the esophagus of disrupting the valvelike action at the cardia and allowing reflux of gastric secretions into the esophagus. The esophageal mucosa has no resistance to this type of reflux, and the marked irritation of esophagitis results.

The usual cause for disruption of the cardia's valvelike mechanism is sliding hiatus hernia. This is an extremely common problem. Gastrointestinal studies of a large number of patients revealed that about 10 percent had some type of hiatal defect and hiatal herniation. However, a great many such patients are asymptomatic.

In about 95 percent of patients with diaphragmatic hernia, the cardia herniates through the esophageal hiatus. Approximately 90 percent of these herniations are the sliding type, i.e., the cardia slides upward through the hiatus. I believe that to adjust to this sliding hernia, the esophageal musculature contracts, resulting in an apparent shortening of the esophagus. Some workers maintain, however, that this is a congenital shortening of the esophagus.

The incidence of this type of hernia is high, but the most important aspect is that many are totally asymptomatic. Thus the problem arises as to the difference between those that are symptomatic and those that are not. After many years of careful observation it became apparent that the symptomatic hernias almost invariably are associated with an ulcer diathesis plus the mechanical situation resulting from the hernia. Whether or not it can be proved by tests, this factor must be very carefully considered in treating symptomatic hiatus hernia. Otherwise, the good results will be transitory and the final result very poor.

The specific mechanisms involved in hiatus hernia are unknown. A great deal has been said about the so-called valvelike action at the cardia, and many studies have attempted to determine whether some intrinsic mechanism, i.e., a specific musculature within the actual fibers of the esophagus or cardia, acts as a sphincter. No positive evidence has been found.

Another theory suggests that the two bundles of the right diaphragmatic crus which make up the hiatus (or the relationship of the distal esophagus and cardia to the muscle bundles of the diaphragm and particularly the angle through which the cardia passes) produce the sphincteric or valvelike action, preventing reflux into the esophagus. When the mechanism is lost and the cardia and lower esophagus slide upward into the chest, the valvelike action is lost and reflux results. The symptoms produced by failure of this mechanism are in most instances very severe. Patients tolerate the symptoms but are miserable. Everything they eat causes distress, and they take antacids constantly. They are never comfortable, night or day, and seriously need help.

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Presented before the fiftieth annual Assembly of the Interstate Postgraduate Medical Association at Cleveland.

Diagnosis

It then becomes necessary to determine whether or not sliding hiatus hernia and esophagitis are present and, if they are, how to treat them. Patients complain of substernal distress—chiefly of constant heartburn—and in the more advanced cases, of dysphagia and regurgiation. Most of these patients have symptoms for years. As the symptoms gradually become more severe, the patients become more discouraged, seeking relief from different doctors and different regimens.

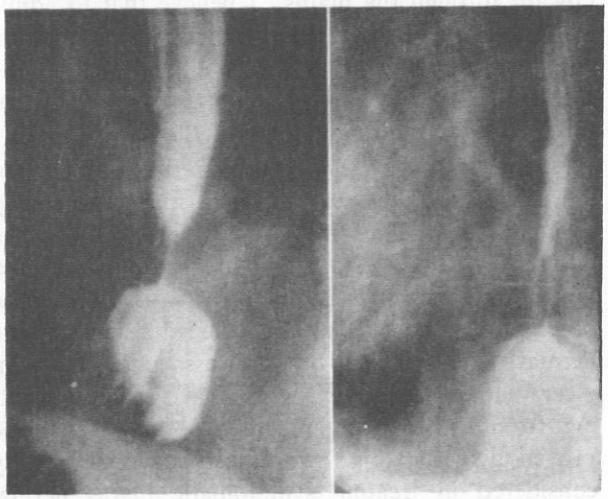


Figure 1. Simple Small Sliding Hiatus Hernia.

Narrowing and funneling of the esophagus characteristic of esophagitis are present.

Fluoroscopy and x-ray examination are, of course, the first studies to be done. Figure 1 shows an x-ray of a simple, very common type of small sliding hiatus hernia. The cardioesophageal junction is at the top of the herniated portion of the stomach, with apparent shortening of the esophagus. Radiographic evidence of esophagitis is seen in the esophagus above the cardia. The esophagus is still smooth, but it has narrowed and the lower half is funneled.

Figure 2 illustrates esophagitis of a more severe degree. The only radiographic evidence of esophagitis in this case is funneling and narrowing of the esophagus. Video tapes and cineradiographic films may be more carefully studied, but even these can reveal only the presence of esophagitis and not the degree of the disease. Furthermore, many patients without this much radiographic evidence of esophagitis may have severe esophagitis.

Therefore, any patient with real symptoms of esophagitis, namely, heartburn and distress, should undergo esophagoscopy. In our experience esophagoscopy has been the only accurate means of determining the degree of esophagitis. This is extremely important, because if a patient has an appreciable degree of esophagitis, an all-out, long-term plan to cure him must be devised. If the disease is not cured, progressive changes in the esophagus will eventually lead to severe structural changes requiring extensive operation. The importance of early diagnosis and treatment has been neglected. Esophagitis is a serious disease, and the patients are so distressed and incapacitated that they warrant the best possible attempt to relieve them.

Once the diagnosis of sliding hiatus hernia with esophagitis is established, an attempt should be made to prove the presence of an ulcer diathesis. Gastric analysis with histamine or betazole hydrochloride (HISTALOG®) or other laboratory procedures should be carried out. In most instances these tests will confirm the diagnosis of an ulcer diathesis.

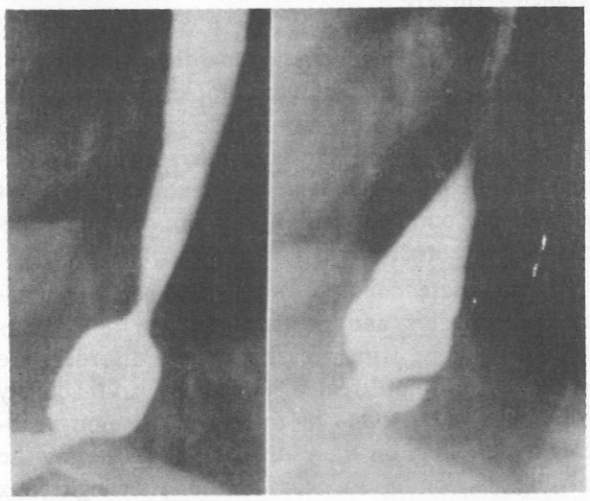


Figure 2. Radiographic evidence of esophagitis of a more severe degree than shown in figure 1.

Medical Management

At this point these patients need a regimen which will control the mechanical situation which has resulted in reflux esophagitis and treats the ulcer diathesis. The situation is similar to that in duodenal ulcer or peptic ulcer in the pylorus, and intensive treatment is important. If patients do not follow a permanent ulcer regimen, they will have recurrences and exacerbations that sooner or later will lead to complications requiring operation. In our experience the problem of esophagitis approximates that of peptic ulcer, except that the former is situated higher in the gastrointestinal tract, is more complicated, and can become even more compli-

cated, particularly when certain serious structural and physiologic changes develop in the esophagus. Thus the permanent maintenance of a good ulcer diet and use of antacids at this stage should be stressed.

Another important factor in treatment which is not sufficiently stressed is development of good eating habits. Gastroenterologists emphasize the kind of foods the patients should have but usually do not stress the importance of eating regularly, of eating a little more slowly than the average individual, and of chewing the food properly. It is difficult to believe the actual size of the pieces of fruit and meat that we swallow. Those of us who have done much surgery of the esophagus and proximal stomach have emphasized proper chewing, because if in the early post-operative period the patient bolts his food and swallows huge chunks, the food may get stuck. It must then be removed with the esophagoscope.

The factor of gravity also must be overcome. The patient will be more comfortable if he sleeps with his head elevated. However, if the patient is told merely to elevate his head, he will put two pillows under it, and during the night he will slide off the pillows and the reflux will be just as marked. It is important, therefore, to explain that the elevation must be from the waist up and is best accomplished by placing a wedge under the mattress.

All the procedures mentioned are important and must be carried out. In addition, the course of these patients must be followed, just as in duodenal ulcer, to be sure that permanent cure is achieved.

Surgical Treatment

If carefully supervised medical management fails because the patients cannot follow the regimen for some reason or if a complication such as bleeding, continued ulceration or obstruction occurs, surgical treatment is indicated. When the necessity for operation has been established, an experienced doctor should select the procedure of choice.

In the early management of diaphragmatic hernia, most of us felt that all these problems were mechanical and that only simple repair was indicated for these small sliding hiatus hernias with severe symptoms. We were not aware of the factors of esophagitis and ulcer diathesis, and we simply repaired the hernia by whatever route we thought best, either above or below the diaphragm. The results were so variable and transitory that we became quite discouraged.

Without question, some types of diaphragmatic hernia are strictly mechanical, and simple repair brings relief. In recent years, however, we have come to believe that if operation is to be performed on a sliding hiatus hernia, the ulcer diathesis must also be surgically treated. Therefore, I prefer the transabdominal approach, with repair of the hernia, vagotomy and pyloroplasty.

If more advanced disease is present, some other type of procedure must be selected to overcome the complications. For instance, if the patient has a long-standing duodenal ulcer and particularly if the ulcer is bleeding, repair of the hiatus hernia should be combined with vagotomy and hemigastrectomy. If actual obstruction with dysphagia is present at the cardia, cardiomyotomy (Heller's operation), vagotomy and pyloroplasty may be necessary in addition to repair of the hernia.

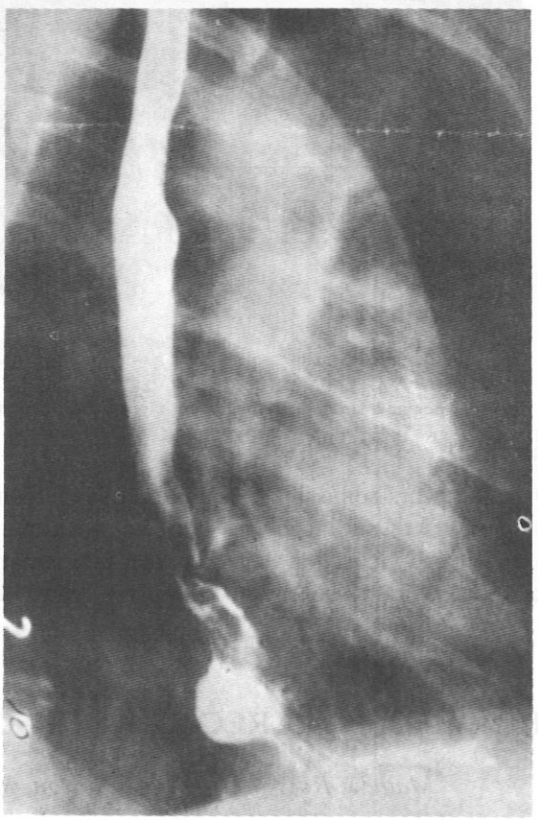


Figure 3. Ulceration associated with esophagitis (advanced stage). Esophagogastric resection was necessary in this case.

If true organic stricture with ulceration of the lower esophagus is present, it must be resected; thus esophagogastric resection, vagotomy and always pyloroplasty are indicated. Pyloroplasty is necessary in any proximal resection for benign disease of the proximal stomach or esophagus.

Figure 3 illustrates an esophageal condition which progressed to ulceration and required esophagogastric resection. Figure 4 shows the course of a man admitted to the hospital 25 times over a period of 30 years for ulcer diathesis, sliding hiatus hernia, and esophagitis. He never followed a regimen longer than necessary to feel a little better and to be able to eat without distress. Finally, bleeding, organic stricture and persistent ulceration at the distal end of the esophagus developed, and when the patient was 78 years old esophagogastric resection was undertaken.

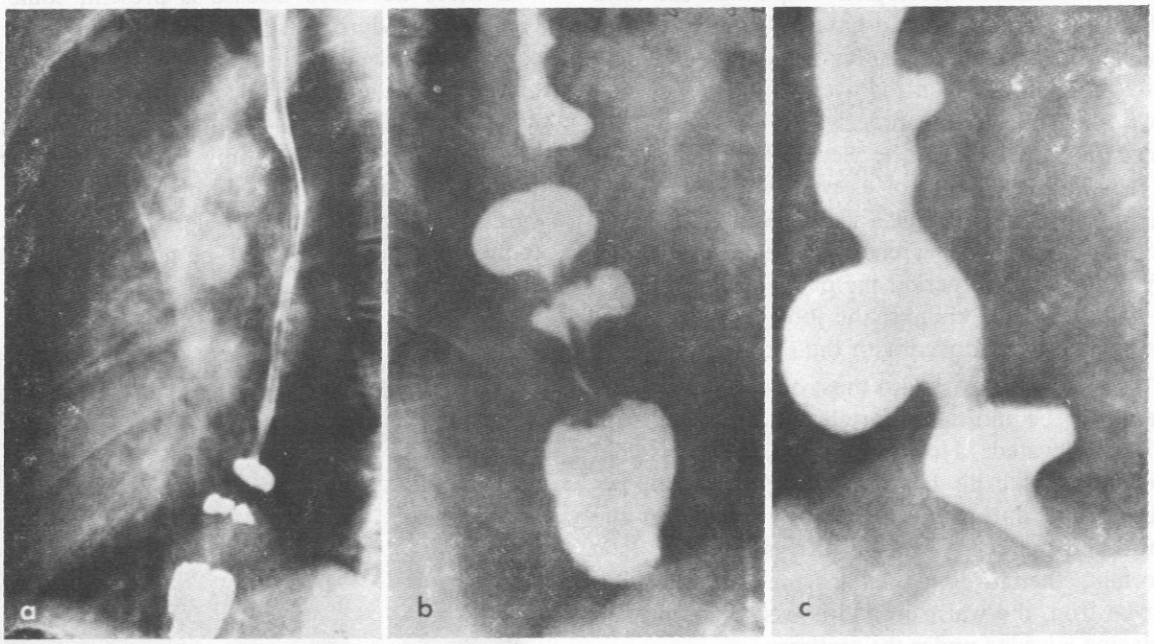


Figure 4. X-rays Made During a 30 Year Course of Sliding Hiatus Hernia, Esophagitis and Ulcer Diathesis.
a. X-ray made at diagnosis showing sliding hiatus hernia.
b. Evidence of beginning esophageal distortion with curling 10 years after onset of disease.
c. Advanced changes in the esophagus caused by a combination of esophagitis and obstruction. Bleeding, organic stricture and persistent ulceration necessitated extensive surgery.

Comment

Over the years some interesting facets of the complex disorders of sliding hiatus hernia with esophagitis and peptic ulceration have become more clearly understood. These conditions can and must be cured, preferably in the early stages before the destructive phase is reached and extensive surgery is required.

Dr. Herbert D. Adams is Captain, MC, USNR

THE PRACTICAL RECOGNITION OF DEPRESSIVE AND SUICIDAL STATES

Mathew Ross MD, FACP, Boston, Massachusetts. Ann Intern Med 64(5): 1079-1086, May 1966.

Of the various medical emergencies that confront today's physician, undoubtedly the most challenging are the psychiatric. The most prevalent of the psychiatric emergency situations are alcoholism, agitated psychotic behavior, and suicidal behavior.[1] The first two are fairly readily recognizable and their immediate management a good deal more straightforward than the suicidal behavior, which may or may not be associated with alcoholism, psychosis,

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or both, and which all too often is the outcome of a depressed state.

Scope of the Problem

Statistics

Every physician can do a great deal more than he is already doing to reduce the shocking rate of suicide in the United States. Nearly 25,000 persons a year commit suicide, and it appears regularly on official statistics among the first ten major causes of death. In reality, because of social, economic, insurance, or legal expediencies, a great many more who commit suicide are reported as victims of other diseases. Every minute of every day one of our citizens attempts suicide, and 60 or 70 times a day someone succeeds. Statistics clearly indicate that suicidal patients, although under medical care for a variety of reasons, do not make their way to psychiatric care often and effectively enough to stem this alarming rate. For example, at least one patient in every six who recently committed suicide in San Francisco had been seen by a physician during the month before the suicide, and more than one in three had consulted a physician in the preceding 6 months. Perhaps their physicians were not sufficiently aware of the seriousness of the problem to protect and to refer them, or they may have made definite recommendations that the patient's family did not carry out.

The situation takes on additional poignancy because the evidence is now conclusive that emotionally ill persons turn first and most often to their physicians, next to their clergymen, and then to the psychologist and psychiatrists. We also know that most people accept the notion that psychological factors are operative in illness and so are able to accept psychological support. One can readily see the value of alerting the nonpsychiatrist physician to any significant diagnostic clues that he might inadvertently overlook. That psychiatrists are all too often dramatically reminded of their own shortcomings in diagnosis and management merely highlights the need for their colleagues to muster their own diagnostic, management, and referral skills. Because few persons try suicide without prior warnings and because so many prove to have been under medical care, we can only conclude that physicians generally are not so alert, searching, and deft in their evaluations and management as might be hoped. There are few pat solutions.

Even though no age, sex, race, or socioeconomic group is totally immune to suicide, there are significant variations within these groups.

The indicators for the recognition and assessment of the suicidal state are both general and specific.

Indicators of the Suicidal State

General Indicators

1. The most prevalent among the general clues to a potential suicide is the presence in the patient of a psychiatric disorder. Nine times out of ten the person who commits suicide has had a psychiatric illness, which half the time is a depressive one and one quarter of the time is chronic alcoholism. In a word, two of every three successful suicides are by patients who have suffered from depression or chronic alcoholism. There is little question that depression is the single most reliable clue to a potential suicide.

2. The more pronounced the symptoms, the graver the danger.

3. Men are more likely to make a serious suicide attempt then women.

4. This is especially true past the age of 45. It is generally true for both sexes that the older the person the more likely his suicidal act will be successful.

5. Residents of changing areas, that is transitional urban renewal areas, particularly if they live alone or isolated from family—as unmarried, separated, divorced, or widowed persons—are greater risks than those who are married and live with their families.

6. The risk of suicide is increased in persons with a history of fairly recent impaired physical health.

7. Finally, in spring and fall the prevalence of suicide is somewhat elevated.

Specific Indicators

1. A previous suicidal attempt, particularly a recent one, indicates an increased suicide risk.

2. One previous, and notably a serious attempt, also indicates an increased suicidal risk.

3. A verbal or written communication of the intent is a serious indicator of high suicidal risk. Contrary to popular misconceptions, people who commit suicide do talk about it, and one should pay careful attention to such statements as "I would be better off dead," "Life is not worth living."

4. A history with evidence of loss—real, threatened, or fantasied—is a specific indicator of suicidal

risk. Such losses as loss of health, loss of a loved one, loss of self-esteem, loss of riches, and even loss of appearance are significant of high suicidal risk.

5. The more chronic the onset of the underlying emotional disorder, the greater the suicidal risk, particularly in those persons in whom depression has existed for over 6 months.

6. The nature of the suicidal attempt is important on two counts. First, those that are carefully planned are apt to be followed by subsequent efforts. Second, when the method is violent, it is a more likely precursor of the subsequent suicidal attempt.

7. Finally, a history of family suicidal attempts and successful suicides has considerable significance. Very often the patient has identified with the family member who has made a previous suicidal attempt.

While these foregoing general and specific indicators are valuable guideposts, they are by no means foolproof. Since depression is so frequent a precursor of suicide, it seems worthwhile to concentrate our efforts on the diagnostic approach to this disorder, particularly in those forms in which it is most frequently encountered by the internist.

Diagnostic Approach

Biologic Functions

While there are many ways in which the internist may become alerted to the diagnostic possibility of emotional disease, there are none more generally reliable than the presence of significant changes in basic biological functions and behavior that are not adequately explained and understood in the light of external and objective realities. Whenever a patient presents numerous complaints and his physical findings fail to reveal an organic basis for the presenting picture, a predominantly emotional disorder should be suspected.

Somatic Equivalents of Depression

Not all who attempt suicide present the classical mood changes of despondency, hopelessness, apathy, and mental and motor retardation. Although some depressive disorders are associated with schizophrenia, organic brain disease, alcohol and drug intoxication, or a generalized physical disease, many are not. Depressive disorders that are major precursors to suicide often present themselves in various deceptive guises, one of the most noteworthy of which is the somatic mask. The alert clinician need not be an expert in psychological medicine to recognize the depressed patient's somatic complaints as manifestations of deep depression if he has developed a familiarity with the physiognomy of depression which permits him the same surety of recognition he has with some of the organic syndromes. The usual and ordinary methods of diagnosis, not specialized, time-consuming techniques and procedures, will serve the unmasking process well and render the seemingly obscure quite apparent. The discerning physician can make a prompt and accurate diagnosis when his sharpened observation and reattuned attention shift freely and frequently between the content and the manner of the patient's presentation.

History

A painstaking history, along with searching and perceptive observation of the patient, is the cornerstone of the approach. At the outset, it is well to remember that the various psychogenic states are generalized disorders affecting the organism as a whole and as such have diverse systematic manifestations that are seldom restricted to presenting disorders of mood and emotion.

Observation

One's first observation may be of a palefaced, sallow person sitting huddled and still in a waiting room chair. Little or no spontaneous activity is evident. Further observation sometimes reveals an accentuation of the facial wrinkles and eyelid folds, a lack of luster to the hair, and some evidence of weight and sleep loss. Careless and even unkempt grooming may also be noted. Some combination of any or all of these initial impressions alerts the shrewd clinician before even the first words of greeting will have been exchanged. If the patient's appearance and manner seem quite changed from what they have been at earlier contacts, the physician has already registered very important data, just as he may when he shakes hands with the patient and perceives the various clues to underlying emotional tone.

Manner of Presentation

Once in the consulting room it is remarkable how often the patient presents the notion that things are different: his world, his life, his bodily functions, his outlook, his habits. It is the earliest phase of depression that is characterized by an over-all pervasive feeling that something is wrong, perhaps an apprehensiveness or a general state of alarm, not

uncommonly linked to a fear of a dread disease such as cancer. More simply there are nonspecific, vague physical complaints such as regional aches and pains or gastrointestinal dysfunction. The patient may indicate a desire to tell his story without interruption or direction, thereby revealing a heightened egocentricity, or he may demonstrate a preoccupation with minutia as though he were conducting "an unsuccessful search for complaints that are adequate to explain his anxious concern".[2] Thus a turning inward, a concentration of interest upon the self, is a significant observation. An averted gaze, an immobility of facial expression and bodily movement, an underlying downheartedness and discouragement may also be prominent features.

Lifting the Somatic Mask

Bodily Feeling—Energy and Fatigue

Characteristically the patient reports a change of bodily feeling expressed as a decrease or loss of the feeling of well-being. Tiredness, fatigue, and heaviness are presented in varying degrees, ranging from difficulty in arising in the morning to such an overwhelming sense of fatigue that the fulfillment of one's obligations in daily living is precluded. A heretofore conscientious person may be so assailed by apathy and sense of fatigue that his work desk becomes hopelessly cluttered with unattended matters. Whereas the sense of fatigue and tiredness that follows muscular exertion and exercise has a pleasant quality, depressive fatigue is unpleasant, unrelieved by relaxation, and quite persistent despite the fact that there has been little or no exertion to account for it.

Sleep Patterns

Sleep patterns are apt to be altered in quite characteristic, almost pathognomonic ways in depression. The usual sleep disorder of depressives is early morning awakening. When anxiety is a prominent feature there may be difficulty in falling asleep. Most typically, however, early awakening and depression go hand in hand. The patient indicates that on retiring he falls asleep easily but awakens early in the morning, feels wide awake but fatigued, and is unable to return to sleep. He experiences considerable difficulty in rising, dressing, and beginning his day. Typically the patient with manic-depressive and involutional depressions feels better as the day progresses, whereas when the depression is secondary to a generalized physical disease, an organic brain disorder, alcoholic or drug intoxication, this diurnal rhythm is inconstant or absent. On further inquiry the patient will probably indicate that he is a light sleeper whose sleep often is disturbed by anxiety-arousing dreams. It is felt that "some patients who fear they may not sleep are afraid they will: the source of the fear being the source of the drives that manifest themselves in the dream content".[3] Continuous electroencephalographic sleep studies of depressed patients indicate that they *do* have heightened arousal responses to auditory stimuli when untreated and return to normal arousal patterns after successful treatment of the depression.[4] Before he prescribes for this insomnia, the wary physician will conduct a meticulous investigation, for he knows that the medication he prescribes may become the suicidally inclined person's means of self-destruction.

In a word, sleep no longer retains its restful quality and now has become uncomfortably altered.

Food: Appetite and Weight

Food equals love is a ubiquitous equation. When one considers that the depressed hold themselves in low esteem and even hate themselves to the point of self-destructiveness, it is clear that their appetite and food habits may have great diagnostic potential. Among the many altered basic biological functions affected by a depressive life stress is appetite. Sustained anorexia is common and with it a concomitant weight loss that is inexplicably disproportionate to the decreased nutritional intake. When women offer the complaint of difficulty in preparing and cooking an adequate meal, we have an even more subtle manifestation of their underlying depressive state. However, it is not invariably anorexia that one encounters, for there are those depressed patients who mask their depression by overeating or overdrinking or both, which in turn may produce a weight gain. Whether food intake is increased or decreased, however, there is no true pleasure in eating, for food seems to have lost its taste and appetite, like life, its zest.

Food as a Tranquilizer

Many persons use food as a tranquilizer. When aesthetic and health considerations pressure some to restrict their food intake, the precarious homeostasis achieved through overeating may become upset and release the underlying depression heretofore "tranquilized" by overeating. It follows, then, that before one places patients on a reducing regimen, one

should become carefully attuned to whatever underlying emotional states may be "larded over."

Gastrointestinal System

The mouth, and indeed the entire gastrointestinal tract, is one of the most common loci for the somatic expression of a depressed state. Of 1,000 diagnostically puzzling patients [5] referred to the psychiatric consultation service of a large teaching hospital, more than one third presented symptoms referable to the gastrointestinal tract: abdominal pain, upper gastric fulness, belching, heartburn, upset stomach, loss of appetite, nausea and vomiting, and constitpation. Eighty-three percent of these patients were subsequently found to have a significant emotional disorder. Of these specific, nonetheless frequent somatic equivalents of depression which are expressed via the gastrointestinal tract, constipation is the most commonly reported symptom. It may appear as a solitary complaint or it may be accompanied by complaints of gas on the stomach, bowel fullness, and abdominal pain. One may attribute constipation to reduced intake, altered and unbalanced dietary composition combined with an altered visceral tone.

Oral Complaints

There are not only the peculiar, vague sensations and a bad taste in the mouth but actual dental pain and discomfort sometimes reported by patients. When patients who have a need for self-punishment are not gratified by the recommendations of their physicians and dentists, they travel from one dental office to another until they find a dentist who is somehow misled by the patient's complaints or overcome by his own desire to make the patient comfortable, only to eventually have the patient complain that the prosthesis never fits, does not feel right, and that the symptoms persist. One interpretation of this is that the patient has accomplished two things in discharging his hostility into a body organ such as the teeth: (1) He has partially destroyed himself, and (2) he has vented his hostile urges upon the dentist.[6]

Sexual Functions

As one reviews other systems he may elicit a whole host and variety of nonspecific dysfunctions, including various menstrual disorders and libidinal loss in the woman and impotence and libidinal loss in the man. These are understandably unresponsive to hormonal treatment.

Social History

Social Suicide

While many persons express their underlying emotional state by somatic and visceral means, there are those whose expressions are predominately social and behavioral. These persons indicate that they are committing what can best be described as social suicide. This can often be diagnosed by an alert physician who explores the social aspect of his patient's life circumstance. Alcoholism, the inexorable drinking one's self to ruin and death, is often not perceived as depressive and truly suicidal in nature, with resultant mismanagement. The social suicidal intent of middle-aged sexual promiscuity and escapades may elude the attention of some physicians with the same ease that suicidal behavior in relation to business activities may. When one is on the alert for these self-destructive aspects, this oversight is less likely.

Management

As in the treatment of any other medical condition the proper management of the depressed patient who is a suicidal risk varies with the intensity of the disorder and the therapeutic skill and experience of the physician. Several methods are available and include in every case ample emotional support. This may take the form of relatively superficial supportive office psychotherapy in the mild case. Where the most significant precipitating factor in the depression seems to be centered about the element of loss, whether of health, a loved one, possessions or self-esteem, the course of emotional support to be offered by the physician, the patient's family, friends, or employer as appropriate have self-evident significance and value. There are a number of antidepressant drugs that seem to be promising and even useful, especially when they are used as adjuncts to emotional support rather than in place of it. Since there is no absolute consensus of the effectiveness of any one group or individual drug within a group of antidepressant medications, the best guideline would appear to be the clinician's own sense of clinical usefulness and his own familiarity with the medication. Recent evidence would indicate some enthusiasm for drug combinations, since it would appear that many of them potentiate each other. It would appear wise to use the simpler and safer preparations at the outset and to utilize the more potent and complicated only after adequate clinical trial with the former group. One should bear in

mind in general that the antidepressant medications are apt to be slower rather than immediate in their effectiveness, even when they are reputed to be rapid-acting.

Another aspect of management which deserves careful consideration is the question of removal of the patient from a noxious situation to a protected environment. Traditionally this has meant a psychiatric hospital, but it is now possible to shelter a good many suicidal risks in the psychiatric units that recently have been developed in the general hospitals. With so much emphasis on psychotherapy and psychopharmacology, it is easy to overlook the often lifesaving value of electrotherapy, particularly in persons suffering from agitated and involutional depressions. A course of electrotherapy may be carried out in an outpatient or inpatient setting provided proper staffing and equipment are at hand. In general, if the patient is sick enough to require electrotherapy, a specialist in psychiatry should administer the treatment. Likewise, if intensive psychodynamic psychotherapy appears to be the treatment of choice, a trained psychiatrist should conduct the therapy whenever possible.

Greatest Danager

When the patient is improving it is natural for the physician to relax his vigilance and his restrictions somewhat. However, this is precisely the time when he must be even more vigilant, for as the depression lifts and motor retardation lessens, the patient is apt to have enough energy to express his underlying suicidal impulse in action whereas in the depths of his despair and apathy he hadn't. Extensive evidence now at hand indicates that most successful suicides occur within the 3-month period subsequent to the onset of improvement. When the danger of suicide is great, prompt hospitalization and, when available, psychiatric referral is indicated.

Summary

Many patients suffering from depressive disorders present themselves wearing a somatic mask that the physician's diagnostic acumen must penetrate if he is not only to prevent the morbidity of the depressive state but also to forestall the development of a suicidal crisis and outcome. Some clues to unmasking these somatic equivalents of depression are delineated. The clinician will determine whether there is an underlying emotional disorder and if so, identify it. He will be particularly alert to the recognition of the patient in the depressive state wearing the somatic mask because of the significance of this state as a precursor to suicide. He will use the general and specific indicators in his assessment of the suicidal risk, recognizing that they are not foolproof. He may then be able to institute the appropriate management and treatment regimen which, as an outcome of early detection, will reduce our alarming suicidal rate. Available to him are hospitalization, a host of antidepressant drugs, psychotherapy, psychiatric consultation, and electroconvulsive therapy. All of these or any combination may be indicated in a given case and may be of lifesaving value when properly instituted.

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THE CYANOTIC INFANT WITH CONGENITAL HEART DISEASE

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In most instances, the first physician to see a patient with congenital heart disease is not a cardiologist. His initial examination and discussion with the parents usually has a long-lasting effect. It behooves this physician to be cautious both in making a diagnosis and giving an opinion for or against heart surgery on the basis of his clinical findings. It is of the utmost importance that this physician recognize the presence of a significant lesion and refer such a patient to an institution that

The opinions and assertions expressed herein are those of the authors and are not to be construed as official or reflecting the opinion of the Naval Service at large.

has the personnel and equipment necessary to adequately treat these disorders. With the recent developments in cardiac surgery, almost all patients with congential heart disease may be benefited by surgery. It is the purpose of this report to review some of the clinical findings present in patients with significant heart disease and to survey the patients under 10 years of age, cyanotic at the time of admission seen at the National Naval Medical Center over the two year period 1963-1965.

Diagnosis of Heart Disease

Since many infants with cardiac malformations are asymptomatic, a murmur may be the only finding. It is not a reliable sign and in the newborn, may disappear. On the other hand, a murmur resulting from a defect may not be heard until later in infancy. Asymptomatic murmurs in infants are not to be neglected. Such a patient requires frequent observations during the first two years of life. Growth is rapid during this period and by five months birthweight is usually doubled. For this reason, the murmur must be well-documented. Follow-up examination at monthly intervals should detect any change in the murmur. This is the most important finding in evaluating a murmur. Above all, parents should neither be unduly alarmed, nor should they be told the child will "grow out of it." Such advice often leads to neglect of a potentially serious problem. It is extremely difficult at times to distinguish the organic murmur from the "functional murmur" on the basis of one or two examinations. Functional murmurs occur at one time or another in over 50% of children. They are usually systolic and located along the left or upper right sternal border. They are vibratory in quality, poorly localized, and may vary with change in position. Systolic murmurs associated with a thrill are usually organic. Diastolic murmurs other than those caused by a venous hum are organic.

Infants with questionable murmurs must be followed over a period of eight to twelve months and even longer if doubt exists.

Dyspnea in a previously asymptomatic child is obviously a sign that cannot be ignored. Easy fatigability may also be present. Parents are the best observers of these changes in their children. One of the manifestations of fatigue in infancy is the length of time required to take feedings. Dyspnea may cause multiple interruptions in the feeding.

Failure to gain weight may mean serious cardiac disease. Normal weight gain usually means satisfactory progress except in a few defects.

The development of cyanosis at birth, shortly afterward, or even several months later may alert the physician to heart disease. Polycythemia usually develops with persistent cyanosis.

Occasionally, manifestations of heart disease are of a serious nature and are cause for immediate diagnosis and treatment. Attacks of paroxysmal dyspnea are due to anoxemia and are characterized by the sudden onset of labored breathing, often with expiratory grunting and increasing cyanosis. Attacks are usually of short duration and are brought on by exertion, excitement or febrile illness. Stridor or choking spells may also be present. A ventricular rate of over 200 per minute lasting for several hours may herald the onset of impending heart failure.

Cardiac size as determined by physical examination in the infant is difficult. X-ray allows an accurate determination of the size and configuration of the heart as well as providing a permanent record for future reference.

The electrocardiogram is of great use. Evidence of either marked right or left ventricular hypertrophy in the first two years of life is usually good evidence of existing heart disease. It is invaluable in the diagnosis of arrhythmias.

If, after adequate physical examination with x-rays and EKG, the physician is still in doubt, the patient should be referred to a competent cardiologist. Sometimes cardiac catheterization must be done to rule out significant heart disease. Even so, it is best to subject the patient to this procedure and find no abnormality, then to miss a lesion that may eventually prove fatal if not treated.

The following list of symptoms compiled by the American Heart Association constitute indications for prompt evaluation:

1. Dyspnea in a previously asymptomatic infant
2. Increasing size of the heart
3. Changing murmurs
4. Easy fatigability
5. Failure to gain weight
6. Development of or increase in cyanosis
7. Polycythemia

Indications for immediate evaluation:

1. Attacks of paroxysmal dyspnea which progress to syncope

2. Progressive cyanosis with dyspnea (even in the absence of a murmur or cardiac enlargement)
3. Stridor or choking spells
4. A ventricular rate of over 200 per minute, lasting for several hours
5. Cerebral vascular accidents—manifested by: hemiplegia, convulsions, other neurological signs
6. Marked cardiac enlargement
7. Cardiac failure

Signs of cardiac failure in infants:

1. Rapid respirations
2. Enlargement of the heart
3. Gallop rhythm
4. Engorgement of the liver
5. Rales in the lungs—usually a later manifestation
6. Pitting edema—a very late and often an ominous manifestation

Surgery of Congenital Heart Disease

With the development of heart-lung machines, many defects that were previously considered inoperable may now be repaired. It is safe to say that all infants with congenital cardiac defects should have the benefit of an opinion as to whether an operation should be done by a competent cardiac surgeon. With the recent and rapid development in this field, this service is usually located in a large medical center. Perhaps, rightly so, for only in this way can procedures become standardized and progress made in the field. It is important that the physician, once he has diagnosed congenital heart disease, refer these patients to such a center. He should not assume the responsibility of making decisions in regard to the possibility of surgery. Depending upon the urgency of the situation, referral should be forthcoming. Often, infants with significant lesions are denied surgery until the general condition of the patient has deteriorated to a serious level. With prompt diagnosis and referral, these cases may be salvaged.

The following is a brief resume of some of the more common congenital heart defects along with methods of treatment. The experience at the National Naval Medical Center over the two-year period (1963-1965) with patients 10 years of age or younger who were cyanotic upon admission is recorded. No attempt was made to include in this study patients above age 10 years or those below age 10 that were acyanotic on admission. Patients with acquired heart disease are likewise not included. In all, 350 patients were admitted with congenital heart disease in the two-year period. Sixty-three patients below age 10 were cyanotic upon admission, either secondary to heart failure or due to a right-to-left shunt.

Patent Ductus Arteriosus

The presence of a continuous murmur is almost diagnostic of a patent ductus. Rarely does the patient show symptoms attributable to the ductus. One is justified in waiting until after age two for repair in order to allow development of adequate size structures. Surgery before school-age is ideal and allows the patient unhandicapped attendance.

A small percentage of patients develop signs of pulmonary congestion and even heart failure. If this situation develops, surgery is indicated even in the first few months of life. The important point to remember is that surgery must be carried out before irreversible pulmonary hypertension has developed. The operative mortality is prohibitive, once this has developed. Patients should be followed yearly or more often if symptoms develop when surgery is being delayed.

During the past two years, four patients with cyanosis below age 10 were seen. Only one had surgery. The other three were cyanotic due to heart failure and responded to conservative therapy. Surgery was delayed until further growth for these children.

Coarctation of the Aorta

In general, coarctation causes little difficulty until later life. The chief findings are hypertension in the upper extremities and diminished or absent pulses in the lower extremities. The ideal age for repair is from about four years to 12 years. Vessels are more pliable during this time, and an adequate collateral circulation has usually developed, allowing the safe clamping of the aorta for resection of the segment. Occasionally, infants develop heart failure unresponsive to therapy and surgery must be carried out during the first few months of life.

Two patients, both infants, with infantile coarctation were admitted cyanotic and expired during the period studied. Both were in heart failure, extremely cyanotic and death came before surgery could be

attempted. More hasty referral may have salvaged these patients, although the prognosis is poor under any circumstances.

Pulmonary Stenosis

Pulmonary stenosis of the valvular type, when significant, may cause dyspnea, fatigue and occasionally syncope. Sometimes there is an associated septal defect and cyanosis may appear in these patients. The operative correction is designed to incise the fused commissures and may be carried out under hypothermia and inflow occlusion in the very young or as an open procedure with cardiopulmonary bypass in patients above two years.

Infundibular pulmonary stenosis usually occurs with other defects and should be corrected by open methods.

Two cyanotic patients were seen in the period studied. One was operated upon with survival. Surgery was not done in the other patient because of small size and the possibility that infundibular stenosis existed which would require cardiopulmonary bypass.

Aortic Stenosis

These patients are usually asymptomatic even in the presence of severe obstruction. The onset of symptoms of fatigue and syncope are ominous signs. Sudden death has been reported. The EKG tracing of left ventricular hypertrophy or myocardial strain may be the only evidence of the severity of the stenosis present in a patient otherwise asymptomatic.

Since the stenosis may be supravalvular, subvalvular or valvular, surgery is best carried out under direct vision with cardiopulmonary bypass. However, in the very small infant with valvular stenosis, hypothermia and inflow occlusion have been employed successfully.

Three cyanotic patients were seen. All responded to digitalis therapy and surgery was delayed until further growth.

Atrial Septal Defects

With small defects, symptoms are rare. Larger defects are usually accompanied by fatigue and dyspnea on exertion. The shunting of blood from the left atrium to the right atrium eventually leads to pulmonary congestion and enlargement of the right side of the heart.

Surgery is carried out with cardiopulmonary bypass and usually is delayed until age four years. The operative mortality is extremely low—less than 1%.

Ostium primum atrial septal defects are of a more serious nature and are often associated with clefts in the mitral valve. These defects are commonly much larger than the secundum defects and thus patients are more symptomatic. Surgical repair, with cardiopulmonary bypass, often requires the insertion of a patch for closure. The operative risk is somewhat higher as complete or partial heart block may occur postoperatively.

Six primum atrial septal defects were seen with none operated upon. One patient died. All were cyanotic and had varying degrees of heart failure. Five of the six responded to conservative therapy. The absence of cyanosis and heart failure in the secundum atrial septal defect reflects the nonurgency of surgery. Over 100 patients with secundum type defects have been repaired at the National Naval Medical Center, with one death. No [illegible] presented with heart failure or cyanosis.

Ventricular Septal Defects

This is a common congenital cardiac anomaly. Many are small, located in the muscular portion of the septum, and are of no significance (Maladie de Roger). Others located in the membranous septum are larger and allow the high left ventricular pressure to be transmitted to the right ventricle. This high ventricular pressure is in turn transmitted to the lungs. Anatomical changes may occur in the pulmonary artery producing high vascular resistance. The onset of pulmonary hypertension demands serious consideration for surgical closure of the defect.

Usually patients develop symptoms of dyspnea and fatigue, with marked susceptibility to upper respiratory infections. Marked increase in pulmonary vascularity with left ventricular hypertrophy is usually present.

With marked pulmonary hypertension, the operative risk makes surgery prohibitive.

Good results have been obtained with closure of the defect before the onset of pulmonary hypertension. The optimum age for repair is five—although occasionally, younger patients weighing 25 pounds are repaired using cardiopulmonary bypass.

Pulmonary artery banding, to diminish the flow to the lungs, is occasionally done in small infants with ventricular septal defects as a palliative procedure. These children have developed signs of

intractable heart failure unresponsive to medications and are too small to be placed on cardiopulmonary bypass.

Six patients have been seen with cyanosis. Two were repaired successfully. Four patients responded to digitalis therapy and surgery was delayed until further growth.

Tetralogy of Fallot

This is the most common abnormality of the heart causing persistent cyanosis that can be helped by surgery. Pulmonary stenosis, ventricular septal defect, right ventricular hypertrophy and overriding of the aorta make up the anomaly. Cyanosis is usually a prominent clinical finding along with dyspnea and squatting. However, these may not appear until the infant begins to sit or walk.

Operative correction is designed to increase the amount of blood flowing to the lungs by complete repair with the use of cardiopulmonary bypass or by a palliative shunt operation. For severely ill patients, small infants, or patients with inadequate sized pulmonary arteries, shunt procedures, such as the Blalock or Potts operation should be done.

Total correction should be advised for children age four or above who are not severely symptomatic —the optimum age for repair being five years. The operative mortality in the latter group should approximate the operative risk of shunt operations.

Eighteen patients were seen—the vast number under four years. Seven had some type shunt. One had complete repair. No deaths occurred. The remainder were advised to await surgery until further growth had taken place.

Transposition of the Great Vessels

This is a common anomaly and the greatest cause of death in infants with cyanotic congenital heart lesions. The aorta arises from the right ventricle and the pulmonary artery from the left ventricle. The systemic and pulmonary venous return are in their normal locations. Life is possible only if a septal defect, a patent ductus, or anomalous venous return are present. Cyanosis is usually marked.

Palliative operations to increase the cross-circulation of blood between the arterial and venous circulation may be done successfully but with a significant operative risk. Enlargement of the persisting atrial septal defect (Blalock-Hanlon operation) is such a procedure. A small number of these patients have associated pulmonary stenosis and are usually the longest survivors. The protection afforded the pulmonary vascular tree by the stenosis is thought to account for this longer life. A systemic-artery-to-pulmonary-artery shunt may afford palliation in this situation.

Total correction by complete transposition of the inflow of blood at the atrial level has been carried out with cardiopulmonary bypass with varying success. Usually, these infants are so small and severely ill, the risk of surgery with cardiopulmonary bypass is prohibitive.

Nine patients were seen. Five patients died. Two were operated upon and are surviving. The five deaths occurred in severely cyanotic infants with intractable heart failure before surgery could be carried out. The other two patients were delayed for surgery.

Truncus Arteriosus

A single large vessel, the aorta, receives all the blood from both ventricles. The pulmonary arteries usually arise directly from the aorta but may be absent. Bronchial arteries may supply the lungs entirely. Correction is usually not feasible unless a variant of the above exist which is amenable to surgical correction.

No patients were seen with the defect.

Tricuspid Atresia

The tricuspid valve is obliterated or the leaflets are fused. There is no direct connection between the right atrium and right ventricle. A right-to-left shunt is invariably present for survival. Usually, this is in the form of a patent foramen ovale or atrial septal defect. The right ventricle is hypoplastic. About one-third of the cases have a transposition of the great vessels. Most patients do not survive infancy. Occasionally, the formation of a shunt may be of value, however, prognosis is extremely poor.

Four patients were seen. One patient died. Three patients responded to conservative treatment and no operations were performed.

Miscellaneous Group

In addition to the above patients, several infants with multiple defects were seen. These included Ebstein's malformation—two; patent ductus arteriosus with aplasia of the left pulmonary artery—one; atrial septal defect with endocardial fibroelastosis—one; coarctation, transposition, patent ductus arteriosus and non-functioning left ventricle—one; atretic

pulmonary valve with endocardial fibroelastosis—one.

Discussion

From the group studied, it is evident that approximately 35% of the cyanotic patients admitted had defects not usually considered in the cyanotic group of congenital cardiac lesions. Severe heart failure accounted for their cyanosis. The vast majority of this group responded well to conservative therapy so that operation could be delayed until a more suitable age, or the patient's condition had improved. Patients with acyanotic defects who develop heart failure and signs of respiratory embarrassment must be treated vigorously. They must not be regarded as hopeless until an accurate diagnosis has proven some defect which is totally incorrectable by surgery. Often this requires emergency cardiac catheterization. Occasionally, this does not completely rule out the possibility of surgical relief and exploratory thoracotomy must be resorted to as a final effort.

Obviously, when signs of impending heart failure develop, it is ideal to have such a patient in a cardiac center where catheterization facilities, and trained personnel are readily available. Only in this way will mortality be reduced and progress made. For example, the infant with the relatively benign and easily correctible patent ductus, who develops heart failure with all its attendant problems has a much graver prognosis than the infant who is not allowed to progress to this stage before surgery is carried out.

When the family physician detects a heart murmur the obvious question arises—"Is it indicative of heart disease?" By a careful appraisal of the history and physical findings, an answer can usually be given. If the least suspicion of doubt exists he should refer the child to a cardiac center. Much harm may be done by telling the family that a severe heart defect exists and that the patient must be seen by a specialist at once. It is also a mistake to advise the family that the cardiologist will require special diagnostic tests, such as catheterization, before making a diagnosis. The cardiologist may be able to make an accurate diagnosis by clinical means alone. It is best to leave discussion of special diagnostic procedures and the advisability of surgery to the cardiologist. In this way, parents are usually more agreeable to recommendations concerning their child. Such an attitude toward the care of infants with congenital heart disease allows a more agreeable environment to which the child may later be returned after diagnosis and treatment.

A brief summary of some of the more common types of congenital heart disease is recorded along with the experience at the National Naval Medical Center of 63 children admitted with cyanosis below 10 years of age. A plea is made for prompt referral of patients that show signs of heart decompensation and patients that have asymptomatic heart murmurs for diagnosis.

PENETRATING WOUNDS OF THE ABDOMINAL WALL*

A NEW DIAGNOSTIC TECHNIQUE

By William P. Cornell MD and Paul A. Ebert MD, Baltimore, Maryland. *Am J Roentgenol 96(2): 414-417, February 1966.*

Penetrating wounds of the abdominal wall represent a difficult diagnostic problem to the clinician regarding the presence or absence of intra-abdominal injury. Immediate exploratory laparotomy has usually been advised to determine if any injury has occurred to the abdominal contents. This method of treatment has prevented most of the complications of penetrating abdominal wounds, but has resulted in a large number of unnecessary operations. At the Johns Hopkins Hospital during the past 10 years, only 40 percent of abdominal stab wounds were shown at the time of surgery to have penetrated. In the present report a technique is described by which it can be determined whether penetration into the abdominal cavity has occurred.

Method

The procedure [1] was carried out in each case in the Emergency Room, using standard roentgenographic equipment. The area around the stab wound is prepared with septisol and aqueous zepharim to

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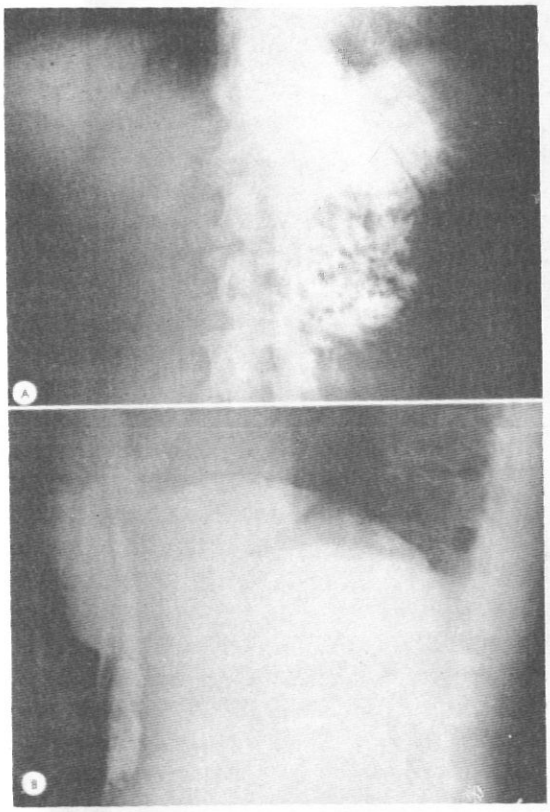


Fig. 1. (*A*) Anteroposterior roentgenogram of the abdomen demonstrating a large subcutaneous collection of contrast material. (*B*) Lateral abdominal roentgenogram in the same patient revealing that the contrast material is confined to the abdominal wall and does not enter the peritoneal cavity.

establish a sterile field. A number 14 French catheter is inserted through the skin wound into the subcutaneous tissue without making any attempt to find the tract or to pass the catheter directly into the peritoneal cavity. The skin edges are secured tightly around the catheter with a purse string suture of oo-silk. Sixty to eighty cubic centimeters of sodium diatrizoate (hypaque 50 percent) with 1 cc. of methylene blue is injected into the catheter under careful observation to be certain that the solution does not leak out of the wound onto the abdominal wall. The catheter is then clamped and abdominal roentgenograms are made. Both anteroposterior and lateral studies are obtained in the recumbent position. When necessary, oblique views of the abdomen are included to clarify the location of contrast material.

In order for a study to be considered satisfactory, it is necessary for a large opaque area of contrast material to be seen on the roentgenogram (Fig. 1, *A* and *B*). This diffusion of contrast material demonstrates that a sufficient quantity is injected to follow the tract of the penetrating injury and enter the peritoneal cavity, if such an opening exists (Fig. 2, *A-D;* and 3, *A* and *B*). The methylene blue is added to permit recognition at the time of laparotomy and to facilitate interpretation of the roentgenograms.

Results

To the present time, the study has been performed in 40 patients. In one patient early in the series the study was considered unsatisfactory for interpretation. All 12 patients with roentgenographic evidence of contrast material in the peritoneal cavity had a definite laceration of the peritoneum at the time of laparotomy. None of the 10 patients whose test was interpreted as negative for penetration into the abdominal cavity had perforation of the peritoneum at operation. There were 18 patients who had no roentgenographic evidence of contrast material entering the peritoneal cavity that did not have laparotomy. These patients had no clinical evidence of intra-abdominal injury and were discharged after 48 hours of observation. None of these patients showed late evidence of injury.

Comment

There have been no adverse effects such as infection or necrosis of the underlying tissues following injection of sodium diatrizoate into the wounds. Patients complained of minimal discomfort at the time of injection. The material is completely absorbed from the tissues in 36 hours. Opacification of the renal collecting system is usually seen on the roentgenograms, indicating the rapidity in which the contrast material is absorbed (Fig. 4). There have been no false negative or false positive interpretations of the test to date. The study was considered unsatisfactory in one patient early in the series. If the study is positive for penetration of the peritoneum or not satisfactory for interpretation, immediate exploratory laparotomy is performed. Although we have encountered no false negative examinations to date, it is our practice to carry out early exploration in all patients with penetrating abdominal wounds. If these early results are borne out in our continuing experience, it may be possible to carry out a more conservative program of management in patients with negative studies.

Summary

On the basis of preliminary results obtained by injection of wounds with radiopaque contrast mate-

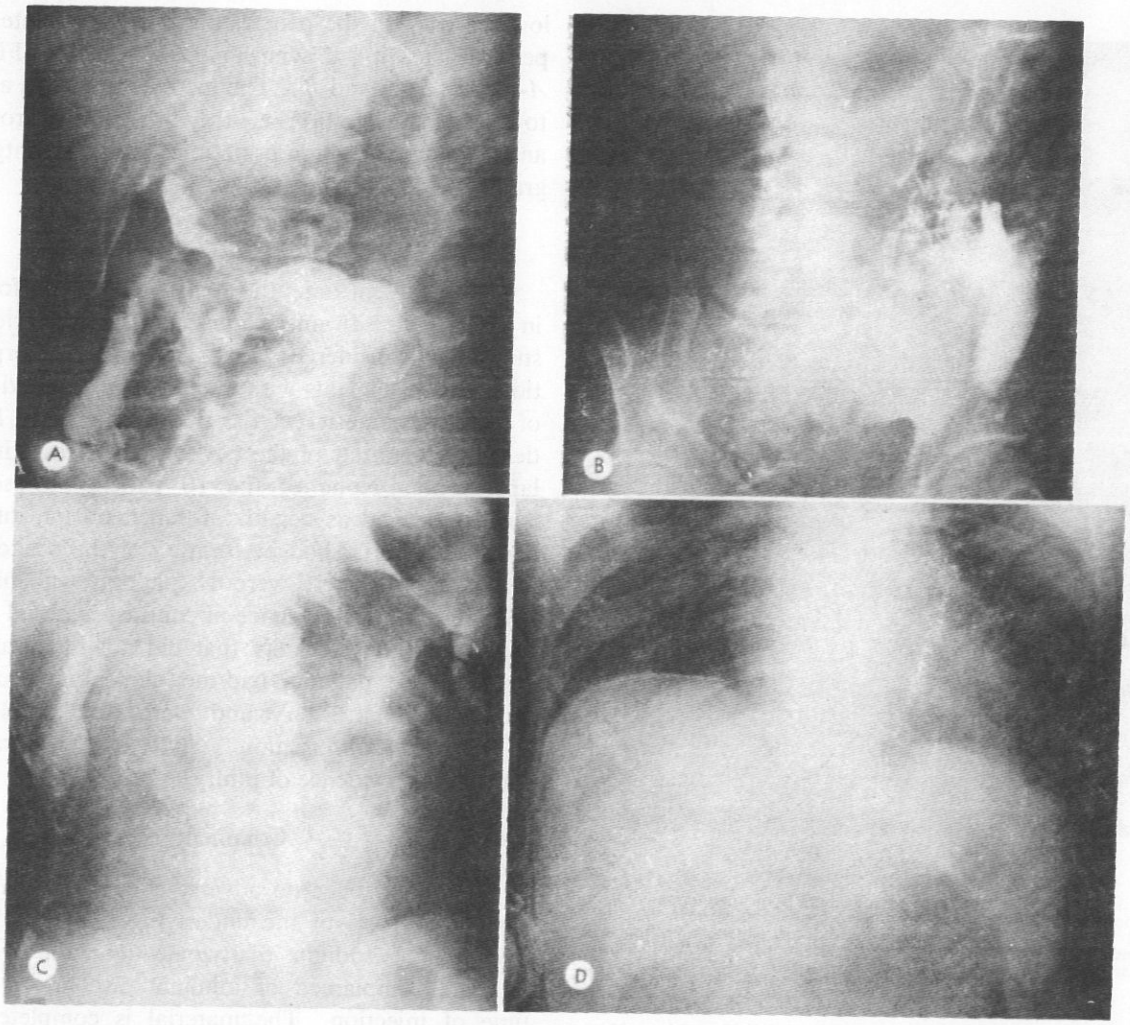


Fig. 2. (*A*) Anteroposterior roentgenogram of the abdomen in recumbent position demonstrating a large quantity of contrast material in the peritoneal cavity, outlining the large and small bowel and the under surface of the liver and (*B*) the splenic flexture. (*C*) Contrast material outlining the right lateral peritoneal reflexion and undersurface of the liver and (*D*) contrast material around the liver as well as the spleen and splenic flexure of the colon.

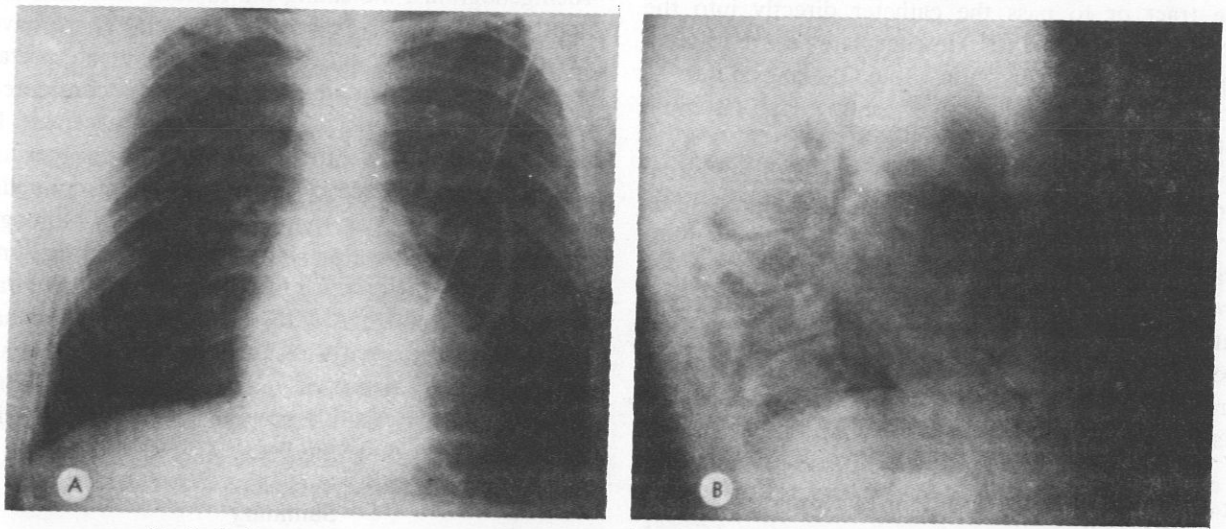


Fig. 3. Patient stabbed just above the diaphragm with an ice pick. Injection of contrast material demonstrated in the (*A*) anteroposterior and (*B*) lateral roentgenograms that neither the peritoneum nor the pleural spaces were entered. The hypaque is confined to the anterior mediastinum.

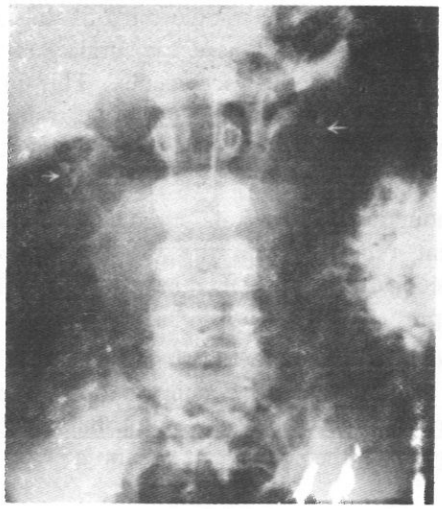


Fig. 4. Abdominal roentgenogram following injection of stab wound. The contrast material did not enter the peritoneal cavity and is seen in the renal collecting system (arrows).

rial, we can state that failure to demonstrate penetration of the peritoneal cavity is strong evidence that the peritoneum is not punctured. This is a continuing study and a full evaluation of a more extensive experience will be the subject of a subsequent report. The technique as described is simple to perform, safe for the patient, appears to be reliable and is another example of the value of diagnostic roentgenographic techniques in the treatment of the acutely injured patient.

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DENTAL SECTION

DENTAL CARIES AND ALVEOLAR BONE LOSS IN GNOTOBIOTIC RATS INFECTED WITH CAPSULE FORMING STREPTOCOCCI OF HUMAN ORIGIN

Gibbons, R. J., Berman, K. S., Knoettner, P. and Kapsamlis, B. Arch Oral Biol 11(6): 549-560, June 1966.

Recent studies have indicated that several types of bacteria can induce cariogenesis in rodents, but an unusual degree of specificity was involved. Most recently, certain human oral streptococci which were serologically similar to rodent cariogens, were shown to be cariogenic also to rodents. This report describes the isolation and characterization of capsule forming streptococci from human caries lesions, which were able to induce both caries and alveolar bone loss when introduced in pure culture in gnotobiotic rats. From soft debris in open caries lesions in three 14-16 year old male patients, four anaerobic streptococcus strains which were able to store iodophilic polysaccharide from glucose were compared to a series of known rodent cariogenic and noncariogenic strains. Of the four human strains, one (GS 15) produced neither caries nor bacterial plaque in rats. Two strains (PK 1 and LM 7) produced large numbers of extensive fissure lesions. The fourth human strain (GS 5) developed extensive caries involving fissure, proximal and root surfaces, averaging more than 14 lesions per animal. All animals inoculated with the latter three strains, PK 1, LM 7 and GS 5, developed bacterial plaque in the fissures. Strain GS 5 also developed large gingival plaque deposits which extended into developing periodontal pockets. Strain LS 7 developed similar but less extensive gingival plaque. All animals monoinfected with strain GS 5 developed localized areas of extensive alveolar bone loss. Strain LM 7 developed similar but less extensive areas of bone loss. Control rats, and those monoinfected with other test organisms did not develop observable bone loss. Thus it is evident that infection with only certain strains of bacteria can lead to alveolar bone loss under the experimental conditions of this report. While human strains GS 5, PK 1 and LM 6 had metabolic characteristics almost identical with the cariogens of rat origin, strain GS 15 differed in that it failed to ferment sorbitol and mannitol. In micro-precipitin tests, the human cariogens cross reacted to some extent with anti-sera prepared against both hamster and rat cariogens. All streptococcus strains tested produced nondialysable extracellular capsular material. Without exception, more capsular material was produced

from sucrose than from glucose. In addition, the cariogenic streptococci produced significantly more capsular material on sucrose than did the non-cariogens. The degree of a alveolar bone loss appeared to be related to the individual streptococcal strain's capability to produce capsular material, and dental plaque.

AN UNUSUAL GUNSHOT WOUND OF THE FACE

Stoopack, J. C. and Johnston, W. C. Oral Surg, Oral Med & Oral Path 22(1): 132-136, July 1966.

This case report relates the unusual degree of minimal trauma resulting from a potentially lethal gunshot wound to the middle third of the face, and the intraoral approach used for surgical removal of the osseous and bullet fragments. This proved to be the conservative method, in that no residual facial scarring occurred or became a factor in the final result.

Although the general surgeons recommended fragment removal from the external approach, it was decided to attempt removal intraorally first. This approach proved to be successful.

Follow-up examination of the patient failed to reveal any postoperative complications, other than a slight transient weakness of the facial muscles in the region of the left ala of the nose.

PERSONNEL AND PROFESSIONAL NOTES

COMMENDATIONS TO TWO DENTAL OFFICERS. LT R. B. Scott DC USNR was recently awarded the Navy Commendation Medal for meritorious service while serving with the 3rd Dental Company, 3rd Marine Division (Rein) FMF. LT Scott's citation reads in part as follows:

"In addition to his regular duties, Lieutenant Scott was instrumental in establishing a civic action-program which involved the presentation of dental lectures at the Hue University Medical School, regular outpatient visits to Tay Loc Buddhist Orphanage, Tu Dam Pagoda, Nam Hao and Hoa Loung. He frequently visited areas of questionable security such as the outlying hamlets of Khe San, where he was the first dentist ever seen by the Montagnard villagers. By his exceptional professional skill, sincere concern for the needy Vietnamese and unfaltering dedication to duty throughout, Lieutenant Scott upheld the finest traditions of the United States Naval Service".

LT J. C. Lufkin DC USN received a letter of commendation from the Office of the Senior Advisor, Quang Nam Special Sector, Vietnam, LT Lufkin's citation reads in part as follows:

"You have volunteered to come to Quang Nam Special Sector during your off duty time to provide dental treatment to the soldiers and civilians of the sector. Many of the people treated by you and your team have never before received any type of dental care. The sacrifice of your off-duty time in order to assist the Vietnamese people has contributed significantly to their health and welfare and to the accomplishment of our mission in Vietnam."

ACDUTRA FOR DENTAL ENSIGNS AT U. S. NAVAL ACADEMY. Amid the historic surroundings of the Naval Academy, the United States Navy is helping to shape the future of its Dental Corps.

The Dental Indoctrination Program, for dental students enrolled as Ensigns, U.S. Naval Reserve in their respective schools, is established under the joint leadership of Line and Dental Corps officers. The two weeks of indoctrination prepare the newly commissioned Ensigns in naval orientation, leadership, damage control, military law and mass casualty treatment. Field exercises are conducted in the treatment of casualties under simulated battle conditions. Indoctrination cruises are also given on the Academy's training ships. Three such classes are held on the Academy's grounds during each summer.

Upon graduation from the course, the officers return to their respective academic institutions to complete their studies before reporting for a three-year tour of active duty.

NURSE CORPS SECTION

"SERVICE IN A CRISIS"

LT Frances Crumpton, Navy Nurse Corps Programs Officer for the states of Florida, Georgia, Alabama, and Mississippi, represented the Navy at the Annual Convention of the National Student Nurses' Association in San Francisco. Prior to her present assignment, LT Crumpton served a year's tour of duty in Vietnam and was awarded the Purple Heart for injuries received in the December 24, 1964, bombing of the Brink Hotel in Saigon.

As a participant in the convention symposium, "Service in Crisis," LT Crumpton spoke on nursing care during a state of military emergency, including activities within the U.S. Naval Hospital Saigon; the mass casualty program; the people-to-people program; and the special U.S. Marine Corps project "Operation Cleft Lip" for Vietnamese children.

A native of Haleyville, Alabama, LT Crumpton was graduated from the Druid City Hospital of Nursing, Tuscaloosa, Alabama. She received a baccalaureate degree in nursing from the University of Alabama and has been on active duty in the Navy since 1960.

"Young ladies, as I look at you tonight, I recall so vividly when I was where you are. And now I would like to ask that you come with me where I have been. It was a long journey from my student days at the University of Alabama School of Nursing to the U.S. Naval Hospital, Saigon, and upon arrival I encountered a world of textbook nursing come to life. The nurse in any capacity, whether student nurse or director of nursing, is exposed to the ravages inflicted upon the human body by injury and disease. But to no nurse is this tragedy more graphically demonstrated than to the military nurse who serves in a national crisis.

In a hospital emergency room, it is heartbreaking to meet the eyes of a stricken father over the draped body of his teenage son—the victim of a traffic accident. But grief acquires a new dimension for the nurse who views a soldier's shattered body sacrificed on a battlefield 9,000 miles from his country.

This man and his comrades have fought and suffered and died, as men always do in war. And as military nurses have always done since Florence Nightingale walked among the dying at Crimea, I was compelled in Saigon to acknowledge the concept of mass casualty nursing. Under the mass casualty program, casualties are classified by the



surgeon according to the amount of treatment they will require into one of the following four classes: class one, minimum treatment; class two, immediate treatment; class three, delayed treatment; class four, pending treatment.

Although as student nurses we are taught that where there is life there is hope, the military nurse must accept the fact that those casualties in class 4 have lowest priority for surgery. The reason for this is obvious: the operative procedures would be so long and technically complicated that to attempt them would jeopardize the lives of too many other casualties. Although surgery must be postponed, the nurse learns the value of moral support as she comforts the injured men. She may be unable to do more than to remember the smile and to forget the endless hours she has been on her feet.

In describing to you these adjustments that the military nurse must make, I do not mean to imply that the application of her nursing skill is in any degree diminished. On the contrary, the number of patients, the extent of their injuries, and the certainty that they will be followed by others make it necessary for her to function at the height of her professional capacity.

In the emergency room of the U.S. Naval Hospital in Saigon, some of the more serious injuries I observed were extensive lacerations, severe crush injuries of extremities, incomplete amputations, abdominal wounds, massive burns, and bullet wounds of the chest. Although I am a surgical

nurse, never before had I been faced with a challenge such as this. The nurse was responsible for close observation of a patient's vital signs, reporting any change to the physician, and for keeping an accurate record of the total intravenous intake of each patient. She supervised skin preparation for surgery; proper suctioning to maintain airways; and operation of nasal and mask oxygen and of the bird respirator and ambu bag. In carrying out these procedures, the nurse was a vital member of the team of doctor, nurse, and hospital corpsman cooperating in the effort to restore the health and well-being of the injured.

It is true that these responsibilities might be found in the job description of any emergency room nurse. However, the atmosphere in the emergency room at Saigon was different from that of *any* emergency room in that smell of flesh burned by metal fragments from enemy fire pervaded the air. From this room I once escorted a soldier to the main operating room for completion of an amputation. During the clean-up of the litter on which he had been carried, I found his right foot still laced in the combat boot which had triggered the lethal blast of a land mine.

This man's injury resulted from combat, but if you will recall your medical nursing, you know that malaria and hepatitis can be as deadly as a mortar round. In Vietnam I had my first encounter with the nursing care needs of patients with tropical diseases. It was necessary to place patients suffering from malaria, in isolated screened rooms and to drape the beds with netting at night. Before administering antipyretics, blood for culture had to be collected from each patient whose fever spiked to a given degree. A person ill with malaria requires constant observation for the detection of chills and fever and side effects resulting from drug therapy; he also needs a quiet atmosphere because of the severity of headache, and consistent encouragement to eat in order to overcome weight loss. The elevation of fever and the profuse diaphoresis which follows necessitate frequent bathing, changing of pajamas and linen, and encouraging the patient to drink large quantities of fluids. Because of the high content of purification chemicals in the water supply in Saigon, the oral intake was limited to juices as far as possible. A patient admitted to the hospital with a diagnosis of hepatitis was placed in a private room where he was kept at complete bed rest. The nursing care included frequent feedings of small portions to counteract nausea and weight loss, and careful skin care.

American soldiers who contract malaria or hepatitis in Vietnam are treated with modern drugs in a well-equipped hospital. This is unfortunately not yet the case with the Vietnamese people. The few hospitals are overcrowded, poorly equipped, and understaffed. There are only 200 civilian doctors in the entire country to administer to the medical needs of 16 million people. Cholera, hepatitis, and malaria are so widespread that it is not surprising that the average life expectancy is only 35 years. The United States recognizes that the Vietnamese conflict cannot be won not only in the jungles and rice paddies, but also by winning the loyalty of the people to the Vietnamese government.

To achieve this aim, a people-to-people program operated by both American military and civilian personnel has been established. The program consists of a number of civic action projects, one of the most important of which is medical aid. Thousands of health clinics have been established to vaccinate the people against disease and American medical personnel also hold sick call in the overcrowded hamlets scattered throughout the countryside.

It was in villages such as these that "Operation Cleft Lip" originated. Under this program, a Marine would arrive at the U.S. Naval Hospital, bringing not only the child who needed cleft palate surgery but also the child's mother and other members of his family. The procedure for admitting the young patient to the pediatric unit was very unlike any with which you are familiar. In the first place, the nurse needed an interpreter to explain to the mother what would happen to the child, thus relieving her apprehension in the unfamiliar surroundings and gaining her cooperation in caring for the child. In unpacking the paper bag which contained the patient's belongings, the nurse would not find the many toys that accompany most American children to the hospital. Perhaps his mother would be able to bring only an extra pair of faded cotton pajamas for him but the smile which brightened her face when she saw him after surgery was that of a grateful mother anywhere.

"Operation Cleft Lip" was the people-to-people program to which I contributed my nursing skills while stationed at the naval hospital. However, two Navy nurses are presently assigned full-time with an American surgical team in a local hospital in South Vietnam. This team is working side by side with Vietnamese doctors and nurses in treating the civilian population. My words are inadequate to describe to you the conditions under which they

perform. A daily change of bed linen for every patient is not available, and in some cases a bed is not available—only a straw mat, which may be shared with one or two other patients. Preparation of meals is not the marvel of dietetics that it is in American hospitals. Food for the patients, which usually consists of a bowl of rice and some tropical fruit, is prepared by their families and brought daily to the hospital. Despite the handicaps of these primitive conditions, progress is being made in improving the quality of both medical treatment and nursing care.

No discussion of military nursing in Vietnam would be complete without reference to the contribution being made by the hospital ship, USS REPOSE, now deployed in waters off the coast of South Vietnam between DaNang and Chu Lai. Administration of the former U.S. Naval Hospital in Saigon has been transferred to the Army, and Naval medical facilities are now concentrated aboard the REPOSE. This ship saw service during the Korean Conflict and was then known as the Angel of the Orient. At a cost of 9 million dollars, she has been recommissioned to again bring to the front lines the most modern equipment and supplies.

This floating hospital has a 750-bed capacity in 21 wards. It is air-conditioned throughout; there are operating rooms, recovery areas, an intensive care unit. She is fully equipped, with such complex, life-saving devices as an artificial kidney and a heart-lung resuscitator and even radio pillow-speakers which help the patients to pass the long hours of convalescence.

The medical staff of the REPOSE consists of 22 doctors, 3 dentists, 29 nurses, and 256 hospital corpsmen. The professional responsibilities of the 29 nurses are the same as those they would have at any naval medical facility, and they also enjoy many of the personal conveniences which would be available to them at shore-based installations. In recognition of the fact that Navy nurses must maintain their feminine charm, a self-service beauty shop, complete with such aids as beauty style sinks, hair-dryers, and tilt chairs, has been installed as part of the nurses' quarters. Through the services of the ship's laundry, they are able to maintain the traditional concept of the nurse in a crisp white uniform and starched cap. In early 1967 a second hospital ship, the USS SANCTUARY, will be joining the REPOSE and her staff will also include 29 nurses.

We now come to the end of our journey into the world of the military nurse who serves in a national crisis. I hope that I have (in some measure) conveyed to you how she contributes her skills to the defense of her country's freedom. The price of our freedom has been high since it was first won by the American fighting man in 1776, and I consider it a privilege to have cared for the men in Vietnam who are paying the price of that freedom in 1966."

NAVY NURSE CORPS OFFICER RECEIVES TWO AWARDS FOR MERITORIOUS SERVICE IN SAIGON

CDR Aline Estelle Morin NC USN, was presented with the Navy Commendation Medal at a Commanding Officer's Personnel Inspection at the United States Naval Hospital in Newport, Rhode Island where she is currently assigned as Chief of Nursing Service.

The Commendation was awarded by the Commander in Chief, United States Pacific Fleet, in the name of the Secretary of the Navy.

CDR Morin was cited for meritorious achievement while serving as Chief of Nursing Service at



CDR Aline Estelle Morin NC USN

the Station Hospital, Headquarters Support Activity, Saigon during the period of 18 February 1965 to 31 March 1966. She distinguished herself by meritorious conduct in the performance of her duties, demonstrating the highest degree of loyalty and professional competency. She worked tirelessly for long hours when the hospital received mass casualties. It was at this time when her organizational ability and nursing acumen were most apparent.

A Navy Unit Commendation was awarded the Headquarters Support Activity, Saigon, by the Secretary of the Navy for its meritorious service in providing vitally needed logistic support to growing numbers of United States and Allied military personnel with minimum resources and personnel.

CDR Morin will be authorized to wear the Navy Unit Commendation Ribbon.

INDOCTRINEE CLASS (NO. 10N) GRADUATES AT NEWPORT, R.I.

Graduation exercises were held on 29 July 1966 at the Women Officer School, Naval Schools Command, Newport, Rhode Island. A total of 131 officers graduated including 124 Nurse Corps officers and 7 MSC officers. CAPT Tracy Cuttle MC USN, Commanding Officer, U.S. Naval Hospital, Chelsea, Massachusetts was guest speaker at the ceremony. ENS John C. Chamberlain NC USNR received the Honor Award for distinction in academic and military subjects. ENS Chamberlain is from Bethlehem, Pennsylvania and will be assigned to the U.S. Naval Hospital, Charleston, South Carolina as a nurse anesthetist. He entered the Navy through Draft Call #38.

LT Katherine Campen NC USNR from Toledo, Ohio received the Leadership Award and is assigned to the U.S. Naval Hospital, Camp Pendleton, California.

LTJG Carl W. Kelly NC USNR from Lakewood, Ohio was elected as the class speaker.

The awards were presented by Mrs. Harold McCormick, President of the Womens Division, Newport County Chamber of Commerce and Mrs. Michael Curran, President Aquidneck Business and Professional Womens Organization.

OCCUPATIONAL MEDICINE SECTION

NOISE: AN OCCUPATIONAL HAZARD AND PUBLIC NUISANCE

WHO Chronicle 20(6): 191, June 1966.

Noise—as a forthcoming volume in the WHO *Public Health Papers* series [1] points out—is not a new feature of the industrial scene. The deafness of coppersmiths was mentioned by Ramazzini in his *De Morbis Artificium* in 1713. Before the Industrial Revolution, however, comparatively few persons were occupationally exposed to noise; but in the modern world machinery and vehicles make it ubiquitous. Many workers are subjected to noise, not only in heavy industry, transport, building, and the armed services, where it would be expected, but also in farming and in offices, traditionally regarded as being quiet. In the U.S.A. alone it has been estimated that some 170,000 males in the 50-59 age group may be eligible for workmen's compensation because of hearing impairment, though many do not claim for fear of jeopardizing their employment. The problem is almost certainly increasing, and many exposed workers develop hearing losses that may be severe; yet little attention is paid to this hazard in many countries. This is because the onset of hearing loss is insidious and because it may be difficult to distinguish impairment due to occupation from that due to advancing age. In addition, many employers may fear litigation or legislation if they agree to investigation of the problem. Lack of interest in the past was partly due to the fact that accurate means of measuring noise and hearing loss were not then available.

The potential cost of noise-induced hearing loss probably exceeds that of any other occupational disease, when assessed in terms of compensation and increased accident rates. It is as important to protect workers against hearing loss as against any other occupational disease or injury.

The Pathology of Hearing Impairment

The ears of healthy young adults are sensitive to frequencies ranging from 20 to 20,000 Hz[2]. Certain

frequencies are heard at lower intensities than others, and the greatest sensitivity is in the range of 1,000-4,000 Hz. Sound begins to be uncomfortably loud at an intensity of 100-200 dB (decibels) and painful at 130-140 dB. The mechanism of damage to the cochlea of the inner ear is not altogether clear. Exposure to excessive noice initially produces a reversible auditory fatigue known as temporary threshold shift. On prolonged exposure, the changes become irreversible. The histopathological lesions in experimental animals begin with swelling and altered staining of the hair cells of the organ of Corti, followed by the destruction of occasional cells in the cochlear area corresponding to 4,000 Hz; and this may proceed to involve the entire cochlea, leaving a bare basilar membrane. There are not detectable changes in the corresponding nerve bundles.

The ear exposed to high sound levels is protected by the acoustic reflex, a contraction of the small muscles tending to fix the ossicles of the middle ear and minimize the disturbance. This reflex is ineffective against violent impulse sounds, such as gunfire, unless it is stimulated by a previous noise.

Deafness is very far from being always of occupational origin. It may be due to trauma, diseases such as otosclerosis, toxins, tumors, or old age. It may also be hereditary. The diagnosis of occupational deafness is often complex and may call for repeated examination. It may be noted that occupational deafness is occasionally due to factors other than noise, such as blows on the head or blasts near the ear that rupture the eardrum or damage the organ of Corti, but these are numerically of minor importance. There is also the barotrauma suffered by aviators, tunnel workers, and divers, caused by sudden changes in atmospheric pressure.

Short exposure to high-intensity noise may rupture the eardrum. Prolonged exposure to noise may cause hearing loss, though this rarely amounts to total deafness.

Any loss from which the ear eventually recovers is called a temporary threshold shift. Transient deafness of this kind used to be common after aeroplane flights. The loss resulting from a day's exposure to noise usually disappears by the following morning, most recovery occurring within an hour or two of the end of exposure; but complete recovery may take as long as 10 days. The extent of the threshold shift depends on the individual, a more or less consistently repeatable phenomenon. Significant shift is not produced by continuous steady noise below 78 dB. For noise of greater intensity, the amount of shift produced is generally speaking, greater for the higher frequencies. Recovery from a temporary threshold shift is usually complete 16 hours after a two-hour exposure, unless the shift exceeds 60 dB, when complete recovery may take several days. It follows that for workers in some industries, even a week-end may be insufficient for recovery.

Intermittent noise is frequently a feature of the industrial environment. A noise heard only during alternate minutes produces about half the threshold shift that it would produce if continuous. Losses from intermittent and continuous noise have been compared in soldiers exposed to gunfire and to tank noise; for the first hour or two losses due to both types of noise were similar, but thereafter they were higher for continuous noise. It follows that rest periods and task rotation may help to limit auditory damage in factories.

Permanent hearing loss begins for frequencies around 4,000 Hz, and an early dip at this pitch is characteristic of occupational deafness. Lower frequencies are progressively involved. Impairment tends to reach a maximum after 10 years' exposure and then to remain constant, but it is unsafe to conclude that anyone who has worked in a noisy environment for 10 years need expect no further loss. The precise relation between temporary threshold shift and permanent loss is not clear. Noise that does not cause temporary loss rarely, if ever, causes permanent impairment, and temporary shift and permanent impairment run parallel on their differing time-scales. Thus, for a given noise, the shift in dB after an 8-hour exposure closely parallels the permanent loss after 10 years' exposure. A reasonable accurate prediction is that the ultimate hearing level at 4,000 Hz will equal the temporary level found two-minutes after the cessation of 5 hours' continuous exposure to the noise in question.

Susceptible persons develop impairment comparatively quickly and are often aware that noise disturbs them unduly. They may experience head noises, nausea, or vertigo after a day's work.

Susceptibility probably represents one end of the scale of sensitivity rather than an innate fragility of the auditory mechanism and it may be transient or persist throughout life. It is important to consider whether the criteria for noise levels should be set low enough to protect this minority, but routine tests to detect susceptible persons are not yet practicable.

Occupational Deafness

A knowledge of the extent of hearing loss in the general population is essential to the study of noise-induced hearing loss, for hearing loss is far from being always of occupational origin. The problem of differentiation is not a simple one, because increasing industrialization and urbanization make it difficult to find any population that has not been subjected to noise.

Occupational deafness, though only a small part of total industrial morbidity (medical and traumatic), is largely preventable, and in some cases prevention is easy. Occupations well known to be associated with hearing loss include aircraft crewing and maintenance, boilermaking, forging, weaving, punch-press operating, tunnelling, foundry work, blasting, shipbuilding, timber-milling and paper-making.

Various factors must be considered in ascertaining whether exposure to a particular noise level has produced, or will produce, hearing loss. These include the overall noise level, together with its composition, duration, and distribution through the working day and working life, the age and sensitivity of the individual, the presence or absence of ear disease, and the efficiency of protective measures.

The maximum intensity to which an unprotected person should be subjected is probably around 135 dB. There is no direct relationship between hearing loss and the energy content of the noise. Other things being equal, high-frequency sounds are more damaging than low-frequency sounds, so that the spectrum of a noise must be evaluated before its potential effect can be assessed.

Hearing-conservation Programmes

The aim of hearing conservation, ideally, is to ensure that hearing is not affected during working life more than it normally would be with aging. On any site the need for action is manifest if speech communication is difficult, or if workers experience head noises or persistent hearing loss after exposure. But the absence of such gross indications should not militate against any decision. It is difficult to define a safe exposure to noise for general application, because types of noise and exposure timings vary widely. It has been tentatively stated that if the sound energy of a noise is distributed fairly evenly and regular exposure occurs for many hours each day and week by week for years, and if the intensity at 300-600 Hz or 600-1,200 Hz is 85 dB, then noise-control measures including hearing-testing and ear-protectors are advisable.

A person with an average loss of 15 dB is just beginning to notice difficulty in speech perception, and this is the minimum loss that is usually accepted legally as a handicap. A conservation programme aimed at detecting loss at 4,000 Hz and preventing this from exceeding 45 dB will usually ensure that the average overall loss is less than 15 dB.

Measurement and Control of Noise

To determine whether a noise is a potential hazard calls for accurate and appropriate instruments.

The sound-survey meter is a small cheap instrument used in preliminary surveys, as when screening sites for possible hazards. The sound-level meter is more sensitive and can be used in conjunction with an analyser. Both instruments measure the overall noise level. Since neither can simulate the total response of the human ear, to approximate to this response they usually contain electrical weightings or filter networks. Their range is usually from 24 to 140 dB.

With many impact noises, the needle of an ordinary meter cannot move fast enough to measure the peak sound pressure. An impact-noise analyser is then used. The cathode-ray oscilloscope usefully presents the wave form of a noise, and is particularly indicated for the study of impact noises.

The octave-band analyser is important because deafness is better correlated with frequencies than with overall intensity. It consists of band-pass filters dividing the audible range into frequency groupings with middle values of 125, 250, 500 Hz and so on, and the actual analysis is performed in the laboratory from a calibrated tape-recording.

In the assessment of continuous traffic noise, graphic recorders may be used in conjunction with a meter to record sound-pressure levels on a paper strip.

If sound levels fluctuate markedly, different observers may obtain differing results using the same meters. Readings must be taken at several areas on the site, as near to the ears of the workers concerned as practicable.

By administrative measures managements can reduce exposure through task rotation, or reducing hours of work, or sitting noisy machinery in remote sections.

Engineering measures ideally begin with the design and location of premises, and with planning for the acquisition of quiet machinery of a reasonably pre-

dictable noise level. It is important for machine manufacturers to appreciate the noise problem, and to design their products accordingly. Economy and noise-reduction go hand in hand, since noise is a waste of energy and badly maintained machines become noisier with wear. The source of a noise must be pinpointed, together with its path of escape to the exterior. It may be possible to reduce noise by changing a machine, process or material—for example, by substituting welding for riveting, rubber for metal, or slow-acting pressure for high-velocity impact.

Safety can be ensured only with the co-operation of the workers, and it is a managerial responsibility to educate them. Yet it is notoriously difficult to persuade workers to wear ear-protectors even in industries known for a high incidence of occupational deafness, and in some places where protectors are issued they are never used. This further emphasizes the importance of the control of noise at source, wherever possible. However, in some factories personal protective devices are the only practicable way of reducing risk. The purpose of an ear-protector is to limit the amount of sound reaching the drum, and there are four main types: plugs, semi-insert plugs, muffs and helmets. More than one type can be worn simultaneously, as when aircraft mechanics use both plugs and muffs for fullest protection. It is unlikely that the total attenuation achievable by any of these methods exceeds 50 dB, and generally it is much less.

Plastic or rubber earplugs are cheap, but the indiscriminate issue of ill-fitting plugs courts failure, because a good fit in the external meatus is important. The ear-muff consists of a pair of cups covering the external ears and connected by a headband. They often afford better protection than plugs and may include built-in telephone receivers for use in very noisy areas. Helmets are designed to cover most of the bony portion of the head, so reducing bone conduction.

If ear-protectors have to be worn continuously, factors such as comfort, ease of communication, and absence of irritation are of great importance. The efficiency of any device may roughly be assessed by comparing the temporary threshold shift on working days when it has and has not been worn. The mean attenuation over the four octaves from 250 to 4,000 Hz is called the noise protection figure. Approximate attenuation values are 8-25 dB for various types of earplug and 25-40 dB for muffs. Satisfactory attenuation depends on the tightness of the seal and, as it may become loosened with movement, its effectiveness should be periodically checked by audiometry.

It is not difficult to persuade workers to wear protectors when exposed to noise levels so high as to be painful, but reluctance is met at lower levels. Users should be able to choose from several types, and they should be made aware of the fact that deafness may develop without their knowledge.

Audiometry

An audiometer is used to measure hearing acuity, and audiometry forms an essential part of any hearing-conservation programme. It enables losses to be detected long before the victim notices any difficulty in conversation, identifies susceptible persons, and evaluates the efficiency of protectors and control measures. Audiometric schemes can hardly be considered expensive when the cost of a single compensation case may exceed that of the necessary equipment. If the number of workers does not warrant the installation of an audiometric room, arrangements can be made with local medical services.

Audiometers must be calibrated regularly; the operator can do this himself if he knows the exact status of his own hearing. Testers must be well trained because an audiogram is a potential legal document. Owing to the phenomenon of auditory fatigue, the audiogram of a person working in a noisy environment may vary with the time of day, and at least 16 hours should elapse between testing and the last exposure to noise; Monday-morning testing is particularly suitable. It is almost always possible to eliminate the effect of background noise by testing in sound-proofed rooms. Owing to the existence of various sources of error, repeat audiograms may differ by 10 dB or more; and no one should be transferred to other work unless testing has been done on different days with consistent results. The greater the hearing loss, the easier it is to obtain accurate repeatable results.

In large plants a number of men can be tested simultaneously by using automatic audiometers with a single supervisory technician; the results are recorded graphically.

Assessment of Disability

Hearing disability may be measured in terms of earning power or of difficulty in hearing everyday sounds and speech. Impairment may affect one or both ears, and it is often difficult to assess the social handicap since audiometric conditions are artificial.

An approach may be made by allocating standard levels of speech loss to correspond to audiometrically estimated losses in decibels at known frequencies.

The assessment of binaural loss is complex. Even total deafness in one ear does not constitute a 50% handicap; if the other ear is normal the currently accepted figure is around 20%. There is no agreed method for assessing the binaural handicap for different degrees of loss in both ears. When the hearing loss at 2,000 Hz is greater than at 500 or 1,000 Hz, a man may hear but be unable to understand because of poor consonant discrimination. The point when disability is first noticed depends on many subjective and objective factors. What matters always is the ability to hear ordinary speech under ordinary conditions. Losses below 15 dB are not usually considered a handicap. At 30 dB loss, the handicap becomes evident to the individual; above 45 dB he needs help to carry on without serious inefficiency; and at 85 dB he is totally incapacitated for speech communication.

There is, as yet, no satisfactory treatment for persistent noise-induced hearing loss. Nevertheless some deaf persons are helped by hearing aids—though these are not as useful for inner-ear deafness as for conduction losses—or by lip-reading and auditory training. Rehabilitation is important and not the concern of employer and doctor alone; the State has a legislative interest in protecting those disabled by hearing impairment, and particular attention should be paid to deaf juveniles entering industry.

Damage-risk Criteria

A damage-risk criterion specifies the maximum sound-pressure level of a noise to which persons may be exposed without risk of significant hearing loss. There is some analogy with the maximum allowable concentration of toxic agents familiar to industrial hygienists; but noise is more complicated since no single limit applies to all its effects. Limits can protect only the majority, and it is impracticable to allow for susceptible individuals—universal protection would necessitate noise levels too low for many industries to achieve or afford. Many suggested criteria relate to long-term exposure and are acceptable degrees of risk. The prevention of loss over the entire range of hearing may be economically impossible. Expert opinion is therefore not unanimous, and the difficulties of incorporating risk criteria into the legislation are many. However, it is rarely difficult for an investigator to give a useful opinion on specific hazards. Intensity is not the sole factor governing risk. There is no safe intensity level without relation to frequency, and damaging levels cannot be defined in terms of sound-level readings alone. Nevertheless, exposure to 150 dB or above should not be allowed. Audiometry is important as a monitor of the particular criterion finally adopted in any factory. All frequencies may not be equally damaging, and criteria must allow for this factor.

Notes

1. Bell, A. (1966) *Noise: an occupational hazard and public nuisance*, Geneva, World Health Organization (*Publ Hlth Pap.*, No. 30).
2. Hz is the abbreviation of Hertz, a unit of frequency equal to one cycle per second.

EDITORIAL DESK

STAFF OFFICERS SELECTED FOR PROMOTION TO REAR ADMIRAL, JUNE 1966



CAPT John S. Cowan

Captain J. S. Cowan was commissioned in the Medical Corps, USN in 1941. He has had several tours of duty with the Marines and was the first Commanding Officer of the Naval Medical Research Laboratory at Camp Lejeune. Hospital duty includes tours at Great Lakes, San Diego, and Philadelphia. At the time of his selection, he was Commanding Officer of the U.S. Naval Hospital, Philadelphia. He is certified by the American Board of Internal Medicine and is a member of the American College of Physicians.



CAPT Harry S. Etter

Captain H. S. Etter was commissioned in the Medical Corps, USN in 1940. Duty has included Chief of Physical Medicine and Rehabilitation Department at the National Naval Medical Center; Deputy to the Fleet Medical Officer, Honolulu, Hawaii; Medical Director and Head of the Medical Department at the U.S. Radiologic Defense Laboratory, San Francisco, California; Deputy Director to the late Director of the Planning Division, Bureau of Medicine and Surgery. He was Executive Officer at the U.S. Naval Hospital, Portsmouth, Virginia when he was selected and now is Commanding Officer of the U.S. Naval Hospital, Bethesda. CAPT Etter is a graduate of the Senior Course in Naval Warfare at the U.S. Naval War College, Newport, Rhode Island.



CAPT Frank B. Voris

Captain F. B. Voris was commissioned in the Medical Corps, USNR in September 1941 and transferred to the Medical Corps, USN in 1946. His designations include Naval Flight Surgeon and Naval Aviator. He is a diplomat of the American Board of Preventive Medicine (Aviation Medicine) and a member of the American College of Surgeons and presently he is serving at the Bureau of Medicine

and Surgery in the Research Division as Assistant for Development and Head of Astronautical Medicine and he is Assistant to the Chief of Naval Material for Medical and Biological Science. On April 21, 1966, CAPT Voris was installed as President of the Aerospace Medical Association.



RADM Fowler W. Martin

Rear Admiral F. W. Martin SC, USN was commissioned an Ensign in the Supply Corps USN in 1938 following graduation from the University of Washington. He has a Masters Degree in Business Administration from Stanford University (1950). He was promoted to Rear Admiral on 1 August 1966 and at the present time he is Deputy Commander, Programming and Financial Management.



RADM Frederic W. Corle

Rear Admiral F. W. Corle SC USN graduated from the Naval Academy with a Bachelor of Science Degree in the class of 1939 and was commissioned an Ensign 1 June 1939. In 1941 he was assigned to the U.S. Navy Supply Corps School, Harvard University and transferred to the Supply Corps, USN. Subsequently he received a Master's Degree in Business Administration (Harvard University). At the time of his selection for promotion he was serving as Commanding Officer, U.S. Navy Electronics Supply Office, Great Lakes. He received the insignia of a Rear Admiral in the Supply Corps, USN from RADM Howard A. Yeager, USN on 11 July 1966.



CAPT Joseph L. Howard

Captain J. L. Howard SC USN was commissioned an Ensign in the Supply Corps, U.S. Naval Reserve in December 1940 after graduating from the University of California in Berkley with a degree of Bachelor of Arts in Economics and he transferred to the Regular Navy in 1943. He has a legal degree. At the time of selection for promotion he was Assistant Chief of Naval Material (Procurement), Navy Department, Washington, D.C. and had additional duty as Director of Procurement, Office of the Assistant Secretary of the Navy (Installations and Logistics) Navy Department.



CAPT Paul E. Seufer

Captain P. E. Seufer received the degree Civil Engineer from Rensselear Polytechnic Institute and Master of Science from Harvard University prior to entering Naval Service. He was commissioned Lieutenant (Junior Grade) CEE, USNR in July 1941 and transferred to the Regular Navy in 1946. When he was selected for promotion to Rear Admiral, he was officer in charge of Construction, Naval Facilities Engineering Contracts, Republic of Vietnam, Saigon.

MEDICAL ASPECTS OF ADVANCED WARFARE

This course is designed to familiarize key Medical Department officers with the general characteristics of, and the problems associated with, air warfare systems with particular emphasis placed on nuclear weapons, missile delivery systems and medical problems related thereto.

CLASS	INCLUSIVE DATES
OZR 9300-4	7-11 November 1966
OZR 9300-4	1-5 May 1967

DEADLINE DATE TO APPLY

19 September 1966
13 March 1967

The above course will be conducted by the U.S. Air Force, at Sheppard Air Force Base, Texas.

Secret Security Clearance is required on all candidates for attendance, and selections will be on a "need-to-know" priority basis.

Requests should be forwarded in accordance with BUMED INSTRUCTION 1520.8 Series and comply with the deadline date as indicated above. All requests must indicate that a security clearance of SECRET has been granted to the officer requesting attendance, and an explanation in regard to their "need-to-know".—Training Branch, BuMed.

SEMINAR FOR NAVAL RESERVE DENTAL OFFICERS

A Military Seminar for Naval Reserve Dental Officers will be held on 5 December 1966, in conjunction with the Greater New York Dental Meeting, at Penn Top North, Statler-Hilton Hotel, New York City, from 1600 to 1800. One point will be credited for registered attendance.—Commandant, THIRD Naval District, New York, N.Y.

JOINT SURGICAL CONFERENCE

A joint meeting of the Surgical Service of the U.S. Naval Hospital, St. Albans, New York, and the Nassau Surgical Society was held on 7 June at the Naval Hospital.

In attendance were members of the hospital's surgical staff as well as several prominent Nassua County surgeons. A total of 89 doctors attended the joint meeting.

The program featured a symposium on Vietnam War Casualties.

Presentations were by St. Albans' Chief of Surgery, CAPT Donald J. Doohan MC USN, "Thoracic and Abdominal Injuries," CAPT William G. Krech MC USN, "Soft Tissue Trauma," CDR John F. Egan MC USN, "Bone and Joint Trauma," and LCDR Martin R. Plaut MC USN, "Peripheral Nerve and Brain Trauma."

CAPT John W. Albrittain MC USN, Commanding Officer, and CAPT Ralph E. Faucett MC USN, Executive Officer were among the St. Albans Medical Corps Officers attending.

Officers of the Nassau Surgical Society are Martin Spatz MD, President, Robert J. Ryan MD, Vice President, Edward J. Kelly MD, Secretary-Treasurer, and Jack W. McElwain MD, Assistant Secretary-Treasurer.—Public Affairs Officer, U.S. Naval Hospital, St. Albans, N.Y.

NOTES FROM THE 4TH ANNUAL NAVAL HOSPITAL ADMINISTRATION SEMINAR

More than 130 years of experience in every phase

of hospital administration was in evidence on May 26 and 27, 1966 in the U.S. Naval School of Hospital Administration when four senior Medical Service Corps Officers presented papers before the NSHA student body. The panel, composed of a Bureau of Medicine and Surgery representative and representatives from a small, a medium, and a large U.S. Naval Hospital was officially billed as the Naval Hospital Administration Seminar. It covered a 2-day span, with the first day devoted to the presentation of papers by the panelists and a short question and answer period following each paper. The second day was devoted entirely to questions prepared by the NSHA class on the multitudinous facets of finance, personnel management, staffing, training, etc.

CAPT E. L. Van Landingham Jr. MSC USN, Commanding Officer, U.S. Naval School of Hospital Administration opened the Seminar and acted as moderator. Papers were presented by CAPT William M. Dreitlein MSC USN, CAPT John H. Bing MSC USN, CAPT George J. Sabbag MSC USN, and CDR Robert M. Tennille, Jr. MSC USN.—Public Affairs Office, NNMC, Bethesda, Md.

AMERICAN BOARD CERTIFICATIONS

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EDITOR'S NOTES

The Appendix a Protective Device?

"A provocative suggestion" was the comment by the editor of the Year Book of Pathology and Clinical Pathology (1964-65 edition, page 89) following the review of a study by James R. McVay Jr., (The Appendix in Relation to Neoplastic Disease (Cancer 17:927-937, July 1964). In his summary, Dr. McVay states that based on a study of 914 cases coming to autopsy in three institutions, the incidence of previous appendectomy in patients dying of carcinoma of the colon is significantly higher than in a comparable control group (patients who died with vascular disease); difference is independent of age. He found also that the incidence of previous appendectomy in patients dying of other malignant neoplasms is significantly higher in the age range 60 years and younger than in the control group, vascular disease; and finally, the incidence of previous appendectomy in patients dying of a group of neoplasms consisting of carcinoma of the lung, breast, cervix, stomach, and pancreas is significantly higher than in the control group. He offered a hypothesis to explain the findings, namely, that the appendix may act as a protective device against enteric viruses that may initiate malignant change in the colon and possibly at various other sites in the body. He felt that if these findings can be

definitely confirmed, removal of the normal appendix should be reconsidered and he suggested that similar studies relative to tonsillectomy should be carried out.

Such a study is reported by Ludwig Gross, Incidence of Appendectomies and Tonsillectomies in Cancer Patients, in the June 1966 issue of Cancer (Cancer 19:849-852) although he does not refer to Dr. McVey's suggestion. In his summary he states, "The incidence of appendectomies and tonsillectomies in 300 cases of cancerous patients was 21 and 23%, respectively, as compared to 19 and 24% of the same respective surgical procedures in 200 patients in similar age groups suffering from diseases other than cancer, consecutively admitted to the same institution. This would indicate that the overall incidence of the above surgical procedures in both groups is nearly the same. However, in the cancerous group the appendectomies in the time span of 16 years or less prior to onset of cancer were significantly higher than in the control group. The same observation barely can be extended to the tonsillectomized cancerous patients. A speculative impression based on recent immunological advances in function of similar organs in animals would suggest that already failing immunological mechanism in the group of patients "designated" to develop cancer is weakened further by additional reduction of lymphoid cells."

"Physicians of the Old Dominion of the United States Navy" is the title of an article published in the Virginia Medical Monthly, December 1965, which was contributed by Robert Edgar Mitchell, Jr., Commander, MC, USNR-R. CDR Mitchell is the Commanding Officer of Naval Medical Reserve Company 5-2, Richmond, Virginia.

The members of his company are fortunate, indeed, to have the opportunity to continue the fine record of the men from Virginia.

USNH, JACKSONVILLE CELEBRATES 25TH ANNIVERSARY

On 1 July the staff of U.S. Naval Hospital, Jacksonville, celebrated the 25th anniversary of the commissioning of the hospital. The present hospital was built in 1941 at a time when the U.S. Naval Air Station was rapidly expanding and a medical facility was needed to meet the needs of the growing military population in the Jacksonville area. The hospital was placed in commission on July 1, 1941 under the command of CAPT Lester L. Pratt with only 41 patients receiving treatment at the time of commissioning.

When World War II was declared both the Naval Air Station and the Hospital expanded at an even more rapid pace. The physical plant at the Hospital was expanded to approximately twice its original size. During the war years with CAPT John J. O'Mally MC USN, as Commanding Officer, the patient load quickly increased: 600 patients in 1942; 800 in 1943; 1,072 in 1944; and an all-time high of 1,800 by 1945. After the war, with the exception of the Korean conflict when there were as many as 512 patients, the census gradually declined until it has stabilized around 375.

Over the years the hospital has slowly changed with additional construction, alterations, and relocations which have been necessary to adjust to the changing times. Today, although the buildings are old, highly trained personnel use the most advanced techniques and modern equipment. Under construction just to the rear of the present structure is a new 400 bed hospital which is expected to be completed in late 1967 or early 1968 at which time most of the present buildings will be razed.

In observance of 25 years of medical service to the community, a few special events took place on this date. During the noon meal a cake cutting ceremony was held in the enlisted staff dining room. The cake, a beautiful replica of the new hospital, was cut by RADM Edward C. Kenney MC USN (Ret) (immediate past Surgeon General of the Navy and former Commanding Officer of this hospital) and the present Commanding Officer, CAPT William S. Baker Jr. MC USN. Following the cake cutting the Chamber of Commerce held a luncheon commemorating the occasion at the Roosevelt Hotel with ADM Kenney as the guest speaker. That evening the staff officers, their ladies, and other distinguished guests gathered at the Hospital Staff Lounge for a gala affair. Highlighting this event was another cake cutting ceremony at which time ADM Kenney made a few remarks.—Public Affairs Officer, U.S. Naval Hospital, Jacksonville, Florida.

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